

SEQUENCE LISTING

<110> Carozzi, Nadine
Hargiss, Tracy
Koziel, Michael G.
Duck, Nicholas B.
Carr, Brian

<120> AXMI-009, A Delta-Endotoxin Gene and
Methods for Its Use

<130> 045600/274148

<150> 60/448,633

<151> 2003-02-20

<160> 23

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<211> 2049

<212> DNA

<213> *Bacillus thuringiensis*

<220>

<221> CDS

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Arg Ile Asn Ser Asn Met Ser Asn Cys Tyr Pro Arg Tyr Pro Leu Ala	
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aaa gat cca caa atg act atg cga aac acg aac tat aaa gaa tgg cta	144
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aat atg tgt gat tca aat aca caa ttt att ggt gat ata agc acg tat	192
Asn Met Cys Asp Ser Asn Thr Gln Phe Ile Gly Asp Ile Ser Thr Tyr	
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Ser Ser Pro Glu Ala Ala Leu Ser Val Arg Asp Ala Val Leu Thr Gly	
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att aac agt gta ggg act ata ctt tcg aat tta ggg gtc cct ttg gca	288
Ile Asn Ser Val Gly Thr Ile Leu Ser Asn Leu Gly Val Pro Leu Ala	
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agt caa tca ttt gga ata att agt agg cta ata ggt att tta tgg gca	336
Ser Gln Ser Phe Gly Ile Ile Ser Arg Leu Ile Gly Ile Leu Trp Ala	
100 105 110	
ggg cct gat cca ttt gaa gca ctt atg gtt ctt gtt gaa gag ctt att	384
Gly Pro Asp Pro Phe Glu Ala Leu Met Val Leu Val Glu Glu Leu Ile	
115 120 125	
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Glu Gly Leu Gln Gly Ile Met Arg Leu Tyr Gln Thr Arg Leu Gln Ala	
145 150 155 160	
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Trp Leu Val Asn Lys Asn Asp Asp Asn Arg Arg Ala Leu Val Thr Gln	
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tat gca att gtt gat aac ttt ttc gaa aag aat atg cca aaa ttc aag	576
Tyr Ala Ile Val Asp Asn Phe Phe Glu Lys Asn Met Pro Lys Phe Lys	
180 185 190	
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Glu Arg Asn Phe Glu Ile Leu Leu Leu Pro Val Tyr Ala Gln Ala Ala	
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Asn Leu His Leu Ile Leu Leu Arg Asp Ala Asp Tyr Phe Gly Ala Gln	
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Trp Gln Leu Gly Asp Asp Glu Ile Arg Asp Asn Tyr Ile Arg Leu Gln	
225 230 235 240	
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Gly Leu Ile Arg Glu Tyr Lys Asp His Cys Ile Thr Phe Tyr Asn Gln	
245 250 255	
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Gly Leu Asn Gln Phe Asn Arg Ser Asn Ala Gln Asp Trp Val Ser Phe	
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Asn Arg Phe Arg Thr Asp Met Thr Leu Thr Val Leu Asp Leu Ala Ile	
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Thr Pro Ile Gln Tyr Phe Asn Phe Ala Asn Leu Ser Val Phe Ser Ile	
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Ile Asn Asn Val Pro Gly Ser Leu Arg Tyr Glu Val Pro Ala Asn Leu	
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cca tcc caa act ata tta tca gaa tta cca gga aag gat aag cca aga	1440
Pro Ser Gln Thr Ile Leu Ser Glu Leu Pro Gly Lys Asp Lys Pro Arg	
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Asp Ala Arg Arg Ser Ser Ser Gly Gly Ile Val Ser Leu Leu Thr Phe	
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Gly Trp Ala His Thr Ser Met Asp Arg Asn Asn Arg Leu Glu Pro Asp	
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Lys Ile Thr Gln Ile Asp Ala Val Lys Gly Trp Gly Gly Asn Ile Gly	
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610 615 620	
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625 630 635 640	
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Ile Arg Tyr Arg Thr Gln Ser Phe Gly Thr His Ala Ile Asp Lys Phe	
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Asn Met Cys Asp Ser Asn Thr Gln Phe Ile Gly Asp Ile Ser Thr Tyr	
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Ser Ser Pro Glu Ala Ala Leu Ser Val Arg Asp Ala Val Leu Thr Gly	
65 70 75 80	
Ile Asn Ser Val Gly Thr Ile Leu Ser Asn Leu Gly Val Pro Leu Ala	
85 90 95	
Ser Gln Ser Phe Gly Ile Ile Ser Arg Leu Ile Gly Ile Leu Trp Ala	
100 105 110	
Gly Pro Asp Pro Phe Glu Ala Leu Met Val Leu Val Glu Glu Leu Ile	

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Arg	Tyr	Pro	Leu	Ala	Lys	Asp	Pro	Gln	Met	Thr	Met	Arg	Asn	Thr	Asn		
			20					25					30				
tat	aaa	gaa	tgg	cta	aat	atg	tgt	gat	tca	aat	aca	caa	ttt	att	ggc		144
Tyr	Lys	Glu	Trp	Leu	Asn	Met	Cys	Asp	Ser	Asn	Thr	Gln	Phe	Ile	Gly		
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Asp	Ile	Ser	Thr	Tyr	Ser	Ser	Pro	Glu	Ala	Ala	Leu	Ser	Val	Arg	Asp		
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gct	gtt	tta	acg	ggc	att	aac	agt	gta	ggg	act	ata	ctt	tcg	aat	tta		240
Ala	Val	Leu	Thr	Gly	Ile	Asn	Ser	Val	Gly	Thr	Ile	Leu	Ser	Asn	Leu		
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ggg	gtc	cct	ttg	gca	agt	caa	tca	ttt	gga	ata	att	agt	agg	cta	ata		288
Gly	Val	Pro	Leu	Ala	Ser	Gln	Ser	Phe	Gly	Ile	Ile	Ser	Arg	Leu	Ile		
				85				90					95				
ggc	att	tta	tgg	gca	ggg	cct	gat	cca	ttt	gaa	gca	ctt	atg	gtt	ctt		336
Gly	Ile	Leu	Trp	Ala	Gly	Pro	Asp	Pro	Phe	Glu	Ala	Leu	Met	Val	Leu		
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gtt	gaa	gag	ctt	att	aag	aaa	agt	ata	gat	cag	cgt	gta	aga	gaa	aat		384
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Thr Arg Leu Gln Ala Trp Leu Val Asn Lys Asn Asp Asp Asn Arg Arg	
145 150 155 160	
gca cta gta acg cag tat gca att gtt gat aac ttt ttc gaa aag aat	528
Ala Leu Val Thr Gln Tyr Ala Ile Val Asp Asn Phe Phe Glu Lys Asn	
165 170 175	
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Met Pro Lys Phe Lys Glu Arg Asn Phe Glu Ile Leu Leu Leu Pro Val	
180 185 190	
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210 215 220	
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Thr Phe Tyr Asn Gln Gly Leu Asn Gln Phe Asn Arg Ser Asn Ala Gln	
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275 280 285	
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Leu Ala Val Lys Thr Glu Leu Thr Arg Glu Val Tyr Thr Asp Pro Val	
290 295 300	
ggg ttt act ggg gta tta gaa agt gga ggt agg act tac cct tgg tat	960
Gly Phe Thr Gly Val Leu Glu Ser Gly Gly Arg Thr Tyr Pro Trp Tyr	
305 310 315 320	
aat cct aat aat aca acc ttt act gct atg gaa aat aac gca aga cga	1008
Asn Pro Asn Asn Thr Thr Phe Thr Ala Met Glu Asn Asn Ala Arg Arg	
325 330 335	
cgt cct tct tat acc act tgg ctt aat cgt att ttt gta tat aca agg	1056
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340 345 350	

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Lys Thr Asp Ser Ile Thr Pro Ile Gln Tyr Phe Asn Phe Ala Asn Leu	
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cgt ctt gaa cca gat aaa att act caa ata gat gca gtt aaa ggt tgg	1584
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515 520 525	
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Val Lys Val Ser Asp Ser Trp His Ser Leu Lys Val Gln Ala Pro Gln	
545 550 555 560	
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565 570 575	
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His Gly Asp Ala Ile Phe Val Glu His Ser Gly Ser Ser His Ile Val	
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Ser Phe Phe Asp Cys Ser Asn Ser Ser Gly Arg Pro Ser Asn Thr Leu	
595 600 605	
cta gag agt gat ttt cgc tat att gat gtt cca ggt att ttt aca cca	1872
Leu Glu Ser Asp Phe Arg Tyr Ile Asp Val Pro Gly Ile Phe Thr Pro	
610 615 620	
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Ser Ile Asn Pro Leu Ile Arg Tyr Arg Thr Gln Ser Phe Gly Thr His	
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Asp Ile Ser Thr Tyr Ser Ser Pro Glu Ala Ala Leu Ser Val Arg Asp	
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Ala Val Leu Thr Gly Ile Asn Ser Val Gly Thr Ile Leu Ser Asn Leu	
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Gly Val Pro Leu Ala Ser Gln Ser Phe Gly Ile Ile Ser Arg Leu Ile	
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Gly Ile Leu Trp Ala Gly Pro Asp Pro Phe Glu Ala Leu Met Val Leu	
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Thr Arg Leu Gln Ala Trp Leu Val Asn Lys Asn Asp Asp Asn Arg Arg	
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165 170 175	
Met Pro Lys Phe Lys Glu Arg Asn Phe Glu Ile Leu Leu Leu Pro Val	
180 185 190	
Tyr Ala Gln Ala Ala Asn Leu His Leu Ile Leu Leu Arg Asp Ala Asp	
195 200 205	

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Tyr Ile Arg Leu Gln Gly Leu Ile Arg Glu Tyr Lys Asp His Cys Ile
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260 265 270
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370 375 380
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Ser Val Phe Ser Ile Glu Ser Leu Ala Arg Ile Tyr Leu Gly Gly Thr
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Glu Ala Asn Asn Tyr Ile Thr Ser Gln Tyr Gly Val Ser Arg Val Ile
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Phe Asn Thr Ser Asn Ile Asn Asn Val Pro Gly Ser Leu Arg Tyr Glu
435 440 445
Val Pro Ala Asn Leu Pro Ser Gln Thr Ile Leu Ser Glu Leu Pro Gly
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Lys Asp Lys Pro Arg Pro Asn Ala Gly Asp Phe Ser His Arg Leu Ser
465 470 475 480
Tyr Ile Ser Asn Phe Asp Ala Arg Arg Ser Ser Ser Gly Gly Ile Val
485 490 495
Ser Leu Leu Thr Phe Gly Trp Ala His Thr Ser Met Asp Arg Asn Asn
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Arg Leu Glu Pro Asp Lys Ile Thr Gln Ile Asp Ala Val Lys Gly Trp
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Gly Gly Asn Ile Gly Phe Val Ile Pro Gly Pro Thr Gly Gly Asn Leu
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Val Lys Val Ser Asp Ser Trp His Ser Leu Lys Val Gln Ala Pro Gln
545 550 555 560
Arg Gln Thr Ser Tyr Arg Ile Arg Leu Arg Tyr Ala Cys Leu Val Thr
565 570 575
His Gly Asp Ala Ile Phe Val Glu His Ser Gly Ser Ser His Ile Val
580 585 590
Ser Phe Phe Asp Cys Ser Asn Ser Ser Gly Arg Pro Ser Asn Thr Leu
595 600 605
Leu Glu Ser Asp Phe Arg Tyr Ile Asp Val Pro Gly Ile Phe Thr Pro
610 615 620
Ser Ile Asn Pro Leu Ile Arg Tyr Arg Thr Gln Ser Phe Gly Thr His
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 20 25 30

aat aca caa ttt att ggt gat ata agc acg tat tct agc cct gaa gct 144
 Asn Thr Gln Phe Ile Gly Asp Ile Ser Thr Tyr Ser Ser Pro Glu Ala
 35 40 45

gct tta agt gta cga gat gct gtt tta acg ggt att aac agt gta ggg 192
 Ala Leu Ser Val Arg Asp Ala Val Leu Thr Gly Ile Asn Ser Val Gly
 50 55 60

act ata ctt tcg aat tta ggg gtc cct ttg gca agt caa tca ttt gga 240
 Thr Ile Leu Ser Asn Leu Gly Val Pro Leu Ala Ser Gln Ser Phe Gly
 65 70 75 80

ata att agt agg cta ata ggt att tta tgg gca ggg cct gat cca ttt 288
 Ile Ile Ser Arg Leu Ile Gly Ile Leu Trp Ala Gly Pro Asp Pro Phe
 85 90 95

gaa gca ctt atg gtt ctt gtt gaa gag ctt att aag aaa agt ata gat 336
 Glu Ala Leu Met Val Leu Val Glu Glu Leu Ile Lys Lys Ser Ile Asp
 100 105 110

cag cgt gta aga gaa aat gct ctt aga gag cta gaa ggt tta cag gga 384
 Gln Arg Val Arg Glu Asn Ala Leu Arg Glu Leu Glu Gly Leu Gln Gly
 115 120 125

att atg aga cta tat caa act aga ctg caa gca tgg cta gtt aac aag 432
 Ile Met Arg Leu Tyr Gln Thr Arg Leu Gln Ala Trp Leu Val Asn Lys
 130 135 140

aat gat gac aat cgg agg gca cta gta acg cag tat gca att gtt gat 480
 Asn Asp Asp Asn Arg Arg Ala Leu Val Thr Gln Tyr Ala Ile Val Asp
 145 150 155 160

aac ttt ttc gaa aag aat atg cca aaa ttc aag gaa aga aac ttt gaa 528
 Asn Phe Phe Glu Lys Asn Met Pro Lys Phe Lys Glu Arg Asn Phe Glu
 165 170 175

att tta ttg tta cca gta tat gca caa gcc gcg aat ttg cat tta att	576
Ile Leu Leu Leu Pro Val Tyr Ala Gln Ala Ala Asn Leu His Leu Ile	
180 185 190	
tta tta aga gat gct gat tat ttt gga gca cag tgg caa tta ggt gat	624
Leu Leu Arg Asp Ala Asp Tyr Phe Gly Ala Gln Trp Gln Leu Gly Asp	
195 200 205	
gat gaa att cgt gat aat tat atc aga cta caa gga ctg att aga gaa	672
Asp Glu Ile Arg Asp Asn Tyr Ile Arg Leu Gln Gly Leu Ile Arg Glu	
210 215 220	
tat aaa gat cat tgt ata aca ttc tat aac cag ggt tta aat caa ttt	720
Tyr Lys Asp His Cys Ile Thr Phe Tyr Asn Gln Gly Leu Asn Gln Phe	
225 230 235 240	
aat cgc tca aat gct caa gat tgg gtg agc ttt aat agg ttt cgt aca	768
Asn Arg Ser Asn Ala Gln Asp Trp Val Ser Phe Asn Arg Phe Arg Thr	
245 250 255	
gat atg aca tta aca gta tta gat ctc gca ata tta ttt cca aac tat	816
Asp Met Thr Leu Thr Val Leu Asp Leu Ala Ile Leu Phe Pro Asn Tyr	
260 265 270	
gat cca cgt agg tat cca tta gca gta aaa acg gaa ttg act agg gaa	864
Asp Pro Arg Arg Tyr Pro Leu Ala Val Lys Thr Glu Leu Thr Arg Glu	
275 280 285	
gtt tat aca gat cca gta ggg ttt act ggg gta tta gaa agt gga ggt	912
Val Tyr Thr Asp Pro Val Gly Phe Thr Gly Val Leu Glu Ser Gly Gly	
290 295 300	
agg act tac cct tgg tat aat cct aat aat aca acc ttt act gct atg	960
Arg Thr Tyr Pro Trp Tyr Asn Pro Asn Asn Thr Thr Phe Thr Ala Met	
305 310 315 320	
gaa aat aac gca aga cga cgt cct tct tat acc act tgg ctt aat cgt	1008
Glu Asn Asn Ala Arg Arg Arg Pro Ser Tyr Thr Thr Trp Leu Asn Arg	
325 330 335	
att ttt gta tat aca agg act cta ggt aat atg tct gat gtg aga aat	1056
Ile Phe Val Tyr Thr Arg Thr Leu Gly Asn Met Ser Asp Val Arg Asn	
340 345 350	
att tgg gga ggg cat aca tta gtt gaa aat gga aat gat ggt tct gaa	1104
Ile Trp Gly Gly His Thr Leu Val Glu Asn Gly Asn Asp Gly Ser Glu	
355 360 365	
ata acc cat aac ttt ggt aaa act gat tct att act cct att caa tat	1152
Ile Thr His Asn Phe Gly Lys Thr Asp Ser Ile Thr Pro Ile Gln Tyr	
370 375 380	
ttt aat ttc gcg aac ctt tct gtt ttc agt att gag tca ctt gct cgt	1200
Phe Asn Phe Ala Asn Leu Ser Val Phe Ser Ile Glu Ser Leu Ala Arg	
385 390 395 400	
ata tat tta gga gga aca gag gct aat aat tat att act agt cag tat	1248

Ile Tyr Leu Gly Gly Thr Glu Ala Asn Asn Tyr Ile Thr Ser Gln Tyr	
405 410 415	
gga gtc tcg aga gtt att ttt aat aca tca aat ata aat aat gta cct	1296
Gly Val Ser Arg Val Ile Phe Asn Thr Ser Asn Ile Asn Asn Val Pro	
420 425 430	
gga tct tta aga tac gaa gtg cct gct aat ctt cca tcc caa act ata	1344
Gly Ser Leu Arg Tyr Glu Val Pro Ala Asn Leu Pro Ser Gln Thr Ile	
435 440 445	
tta tca gaa tta cca gga aag gat aag cca aga cca aac gca gga gat	1392
Leu Ser Glu Leu Pro Gly Lys Asp Lys Pro Arg Pro Asn Ala Gly Asp	
450 455 460	
ttc agc cat aga tta tct tat ata tca aat ttt gat gca cgg cga agt	1440
Phe Ser His Arg Leu Ser Tyr Ile Ser Asn Phe Asp Ala Arg Arg Ser	
465 470 475 480	
agt tca ggc ggt att gtt agt ctt tta acg ttt ggt tgg gca cat acc	1488
Ser Ser Gly Gly Ile Val Ser Leu Leu Thr Phe Gly Trp Ala His Thr	
485 490 495	
agt atg gat cgt aat aat cgt ctt gaa cca gat aaa att act caa ata	1536
Ser Met Asp Arg Asn Asn Arg Leu Glu Pro Asp Lys Ile Thr Gln Ile	
500 505 510	
gat gca gtt aaa ggt tgg ggg ggg aat atc ggg ttt gtc atc cca gga	1584
Asp Ala Val Lys Gly Trp Gly Gly Asn Ile Gly Phe Val Ile Pro Gly	
515 520 525	
cct act ggg ggg aat ttg gta aaa gtc agt gat agt tgg cat tca ctt	1632
Pro Thr Gly Gly Asn Leu Val Lys Val Ser Asp Ser Trp His Ser Leu	
530 535 540	
aaa gtt caa gca cca caa aga caa aca agt tat cgt att cgt ttg cgt	1680
Lys Val Gln Ala Pro Gln Arg Gln Thr Ser Tyr Arg Ile Arg Leu Arg	
545 550 555 560	
tat gct tgt tta gtt acc cat ggg gat gct att ttt gta gaa cac agc	1728
Tyr Ala Cys Leu Val Thr His Gly Asp Ala Ile Phe Val Glu His Ser	
565 570 575	
ggc agt agt cat ata gtt tca ttt ttt gat tgc tca aat tca tca ggt	1776
Gly Ser Ser His Ile Val Ser Phe Phe Asp Cys Ser Asn Ser Ser Gly	
580 585 590	
cgt cca tca aac act ctt cta gag agt gat ttt cgc tat att gat gtt	1824
Arg Pro Ser Asn Thr Leu Leu Glu Ser Asp Phe Arg Tyr Ile Asp Val	
595 600 605	
cca ggt att ttt aca cca tca ata aat ccc tta ata aga tat aga aca	1872
Pro Gly Ile Phe Thr Pro Ser Ile Asn Pro Leu Ile Arg Tyr Arg Thr	
610 615 620	
caa agc ttt ggt acc cac gcg ata gac aaa ttt gaa ttt att cca ctt	1920
Gln Ser Phe Gly Thr His Ala Ile Asp Lys Phe Glu Phe Ile Pro Leu	

625		630		635		640	
aac act ttt ccg aat caa tca tta gaa aaa aga gaa cag gaa gta aat							1968
Asn Thr Phe Pro Asn Gln Ser Leu Glu Lys Arg Glu Gln Glu Val Asn							
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gat cta ttt atc aat taa		1986
Asp Leu Phe Ile Asn *		
	660	

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 <212> PRT
 <213> *Bacillus thuringiensis*

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Asn Thr Gln Phe Ile Gly Asp Ile Ser Thr Tyr Ser Ser Pro Glu Ala	
35 40 45	
Ala Leu Ser Val Arg Asp Ala Val Leu Thr Gly Ile Asn Ser Val Gly	
50 55 60	
Thr Ile Leu Ser Asn Leu Gly Val Pro Leu Ala Ser Gln Ser Phe Gly	
65 70 75 80	
Ile Ile Ser Arg Leu Ile Gly Ile Leu Trp Ala Gly Pro Asp Pro Phe	
85 90 95	
Glu Ala Leu Met Val Leu Val Glu Glu Leu Ile Lys Lys Ser Ile Asp	
100 105 110	
Gln Arg Val Arg Glu Asn Ala Leu Arg Glu Leu Glu Gly Leu Gln Gly	
115 120 125	
Ile Met Arg Leu Tyr Gln Thr Arg Leu Gln Ala Trp Leu Val Asn Lys	
130 135 140	
Asn Asp Asp Asn Arg Arg Ala Leu Val Thr Gln Tyr Ala Ile Val Asp	
145 150 155 160	
Asn Phe Phe Glu Lys Asn Met Pro Lys Phe Lys Glu Arg Asn Phe Glu	
165 170 175	
Ile Leu Leu Leu Pro Val Tyr Ala Gln Ala Ala Asn Leu His Leu Ile	
180 185 190	
Leu Leu Arg Asp Ala Asp Tyr Phe Gly Ala Gln Trp Gln Leu Gly Asp	
195 200 205	
Asp Glu Ile Arg Asp Asn Tyr Ile Arg Leu Gln Gly Leu Ile Arg Glu	
210 215 220	
Tyr Lys Asp His Cys Ile Thr Phe Tyr Asn Gln Gly Leu Asn Gln Phe	
225 230 235 240	
Asn Arg Ser Asn Ala Gln Asp Trp Val Ser Phe Asn Arg Phe Arg Thr	
245 250 255	
Asp Met Thr Leu Thr Val Leu Asp Leu Ala Ile Leu Phe Pro Asn Tyr	
260 265 270	
Asp Pro Arg Arg Tyr Pro Leu Ala Val Lys Thr Glu Leu Thr Arg Glu	
275 280 285	
Val Tyr Thr Asp Pro Val Gly Phe Thr Gly Val Leu Glu Ser Gly Gly	
290 295 300	
Arg Thr Tyr Pro Trp Tyr Asn Pro Asn Asn Thr Thr Phe Thr Ala Met	
305 310 315 320	

Glu Asn Asn Ala Arg Arg Arg Pro Ser Tyr Thr Thr Trp Leu Asn Arg
 325 330 335
 Ile Phe Val Tyr Thr Arg Thr Leu Gly Asn Met Ser Asp Val Arg Asn
 340 345 350
 Ile Trp Gly Gly His Thr Leu Val Glu Asn Gly Asn Asp Gly Ser Glu
 355 360 365
 Ile Thr His Asn Phe Gly Lys Thr Asp Ser Ile Thr Pro Ile Gln Tyr
 370 375 380
 Phe Asn Phe Ala Asn Leu Ser Val Phe Ser Ile Glu Ser Leu Ala Arg
 385 390 395 400
 Ile Tyr Leu Gly Gly Thr Glu Ala Asn Asn Tyr Ile Thr Ser Gln Tyr
 405 410 415
 Gly Val Ser Arg Val Ile Phe Asn Thr Ser Asn Ile Asn Asn Val Pro
 420 425 430
 Gly Ser Leu Arg Tyr Glu Val Pro Ala Asn Leu Pro Ser Gln Thr Ile
 435 440 445
 Leu Ser Glu Leu Pro Gly Lys Asp Lys Pro Arg Pro Asn Ala Gly Asp
 450 455 460
 Phe Ser His Arg Leu Ser Tyr Ile Ser Asn Phe Asp Ala Arg Arg Ser
 465 470 475 480
 Ser Ser Gly Gly Ile Val Ser Leu Leu Thr Phe Gly Trp Ala His Thr
 485 490 495
 Ser Met Asp Arg Asn Asn Arg Leu Glu Pro Asp Lys Ile Thr Gln Ile
 500 505 510
 Asp Ala Val Lys Gly Trp Gly Gly Asn Ile Gly Phe Val Ile Pro Gly
 515 520 525
 Pro Thr Gly Gly Asn Leu Val Lys Val Ser Asp Ser Trp His Ser Leu
 530 535 540
 Lys Val Gln Ala Pro Gln Arg Gln Thr Ser Tyr Arg Ile Arg Leu Arg
 545 550 555 560
 Tyr Ala Cys Leu Val Thr His Gly Asp Ala Ile Phe Val Glu His Ser
 565 570 575
 Gly Ser Ser His Ile Val Ser Phe Phe Asp Cys Ser Asn Ser Ser Gly
 580 585 590
 Arg Pro Ser Asn Thr Leu Leu Glu Ser Asp Phe Arg Tyr Ile Asp Val
 595 600 605
 Pro Gly Ile Phe Thr Pro Ser Ile Asn Pro Leu Ile Arg Tyr Arg Thr
 610 615 620
 Gln Ser Phe Gly Thr His Ala Ile Asp Lys Phe Glu Phe Ile Pro Leu
 625 630 635 640
 Asn Thr Phe Pro Asn Gln Ser Leu Glu Lys Arg Glu Gln Glu Val Asn
 645 650 655
 Asp Leu Phe Ile Asn
 660

<210> 7
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 <212> PRT
 <213> Bacillus thuringiensis

<400> 7
 Met Asp Asn Asn Pro Asn Ile Asn Glu Cys Ile Pro Tyr Asn Cys Leu
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 Ser Asn Pro Glu Val Glu Val Leu Gly Gly Glu Arg Ile Glu Thr Gly
 20 25 30
 Tyr Thr Pro Ile Asp Ile Ser Leu Ser Leu Thr Gln Phe Leu Leu Ser

16

RTA01/2150240v1

945		950		955		960
Glu Gly Arg Ile Phe Thr Ala Phe Ser Leu Tyr Asp Ala Arg Asn Val						
	965		970		975	
Ile Lys Asn Gly Asp Phe Asn Asn Gly Leu Ser Cys Trp Asn Val Lys						
	980		985		990	
Gly His Val Asp Val Glu Glu Gln Asn Asn Gln Arg Ser Val Leu Val						
	995		1000		1005	
Val Pro Glu Trp Glu Ala Glu Val Ser Gln Glu Val Arg Val Cys Pro						
	1010		1015		1020	
Gly Arg Gly Tyr Ile Leu Arg Val Thr Ala Tyr Lys Glu Gly Tyr Gly						
	1025		1030		1035	1040
Glu Gly Cys Val Thr Ile His Glu Ile Glu Asn Asn Thr Asp Glu Leu						
	1045		1050		1055	
Lys Phe Ser Asn Cys Val Glu Glu Glu Ile Tyr Pro Asn Asn Thr Val						
	1060		1065		1070	
Thr Cys Asn Asp Tyr Thr Val Asn Gln Glu Glu Tyr Gly Gly Ala Tyr						
	1075		1080		1085	
Thr Ser Arg Asn Arg Gly Tyr Asn Glu Ala Pro Ser Val Pro Ala Asp						
	1090		1095		1100	
Tyr Ala Ser Val Tyr Glu Glu Lys Ser Tyr Thr Asp Gly Arg Arg Glu						
	1105		1110		1115	1120
Asn Pro Cys Glu Phe Asn Arg Gly Tyr Arg Asp Tyr Thr Pro Leu Pro						
	1125		1130		1135	
Val Gly Tyr Val Thr Lys Glu Leu Glu Tyr Phe Pro Glu Thr Asp Lys						
	1140		1145		1150	
Val Trp Ile Glu Ile Gly Glu Thr Glu Gly Thr Phe Ile Val Asp Ser						
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Val Glu Leu Leu Leu Met Glu Glu						
	1170		1175			

<210> 8

<211> 1178

<212> PRT

<213> Bacillus thuringiensis

<400> 8

Met Asp Asn Asn Pro Asn Ile Asn Glu Cys Ile Pro Tyr Asn Cys Leu						
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Ser Asn Pro Glu Val Glu Val Leu Gly Gly Glu Arg Ile Glu Thr Gly						
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Tyr Thr Pro Ile Asp Ile Ser Leu Ser Leu Thr Gln Phe Leu Leu Ser						
	35	40	45			
Glu Phe Val Pro Gly Ala Gly Phe Val Leu Gly Leu Val Asp Ile Ile						
	50	55	60			
Trp Gly Ile Phe Gly Pro Ser Gln Trp Asp Ala Phe Leu Val Gln Ile						
	65	70	75	80		
Glu Gln Leu Ile Asn Gln Arg Ile Glu Glu Phe Ala Arg Asn Gln Ala						
	85	90	95			
Ile Ser Arg Leu Glu Gly Leu Ser Asn Leu Tyr Gln Ile Tyr Ala Glu						
	100	105	110			
Ser Phe Arg Glu Trp Glu Ala Asp Pro Thr Asn Pro Ala Leu Arg Glu						
	115	120	125			
Glu Met Arg Ile Gln Phe Asn Asp Met Asn Ser Ala Leu Thr Thr Ala						
	130	135	140			
Ile Pro Leu Phe Ala Val Gln Asn Tyr Gln Val Pro Leu Leu Ser Val						
	145	150	155	160		

Tyr	Val	Gln	Ala	Ala	Asn	Leu	His	Leu	Ser	Val	Leu	Arg	Asp	Val	Ser	
				165					170					175		
Val	Phe	Gly	Gln	Arg	Trp	Gly	Phe	Asp	Ala	Ala	Thr	Ile	Asn	Ser	Arg	
			180					185					190			
Tyr	Asn	Asp	Leu	Thr	Arg	Leu	Ile	Gly	Asn	Tyr	Thr	Asp	Tyr	Ala	Val	
		195					200					205				
Arg	Trp	Tyr	Asn	Thr	Gly	Leu	Glu	Arg	Val	Trp	Gly	Pro	Asp	Ser	Arg	
	210					215					220					
Asp	Trp	Val	Arg	Tyr	Asn	Gln	Phe	Arg	Arg	Glu	Leu	Thr	Leu	Thr	Val	
225					230					235					240	
Leu	Asp	Ile	Val	Ala	Leu	Phe	Pro	Asn	Tyr	Asp	Ser	Arg	Arg	Tyr	Pro	
			245					250						255		
Ile	Arg	Thr	Val	Ser	Gln	Leu	Thr	Arg	Glu	Ile	Tyr	Thr	Asn	Pro	Val	
		260						265					270			
Leu	Glu	Asn	Phe	Asp	Gly	Ser	Phe	Arg	Gly	Ser	Ala	Gln	Gly	Ile	Glu	
	275						280					285				
Arg	Ser	Ile	Arg	Ser	Pro	His	Leu	Met	Asp	Ile	Leu	Asn	Ser	Ile	Thr	
	290					295					300					
Ile	Tyr	Thr	Asp	Ala	His	Arg	Gly	Tyr	Tyr	Tyr	Trp	Ser	Gly	His	Gln	
305					310					315					320	
Ile	Met	Ala	Ser	Pro	Val	Gly	Phe	Ser	Gly	Pro	Glu	Phe	Thr	Phe	Pro	
			325					330						335		
Leu	Tyr	Gly	Thr	Met	Gly	Asn	Ala	Ala	Pro	Gln	Gln	Arg	Ile	Val	Ala	
		340					345						350			
Gln	Leu	Gly	Gln	Gly	Val	Tyr	Arg	Thr	Leu	Ser	Ser	Thr	Leu	Tyr	Arg	
	355						360					365				
Arg	Pro	Phe	Asn	Ile	Gly	Ile	Asn	Asn	Gln	Gln	Leu	Ser	Val	Leu	Asp	
	370					375					380					
Gly	Thr	Glu	Phe	Ala	Tyr	Gly	Thr	Ser	Ser	Asn	Leu	Pro	Ser	Ala	Val	
385					390					395					400	
Tyr	Arg	Lys	Ser	Gly	Thr	Val	Asp	Ser	Leu	Asp	Glu	Ile	Pro	Pro	Gln	
			405					410					415			
Asn	Asn	Asn	Val	Pro	Pro	Arg	Gln	Gly	Phe	Ser	His	Arg	Leu	Ser	His	
			420				425						430			
Val	Ser	Met	Phe	Arg	Ser	Gly	Phe	Ser	Asn	Ser	Ser	Val	Ser	Ile	Ile	
	435						440					445				
Arg	Ala	Pro	Met	Phe	Ser	Trp	Ile	His	Arg	Ser	Ala	Glu	Phe	Asn	Asn	
	450					455					460					
Ile	Ile	Ala	Ser	Asp	Ser	Ile	Thr	Gln	Ile	Pro	Ala	Val	Lys	Gly	Asn	
465					470					475					480	
Phe	Leu	Phe	Asn	Gly	Ser	Val	Ile	Ser	Gly	Pro	Gly	Phe	Thr	Gly	Gly	
			485					490						495		
Asp	Leu	Val	Arg	Leu	Asn	Ser	Ser	Gly	Asn	Asn	Ile	Gln	Asn	Arg	Gly	
		500						505					510			
Tyr	Ile	Glu	Val	Pro	Ile	His	Phe	Pro	Ser	Thr	Ser	Thr	Arg	Tyr	Arg	
	515						520					525				
Val	Arg	Val	Arg	Tyr	Ala	Ser	Val	Thr	Pro	Ile	His	Leu	Asn	Val	Asn	
	530					535					540					
Trp	Gly	Asn	Ser	Ser	Ile	Phe	Ser	Asn	Thr	Val	Pro	Ala	Thr	Ala	Thr	
545					550					555					560	
Ser	Leu	Asp	Asn	Leu	Gln	Ser	Ser	Asp	Phe	Gly	Tyr	Phe	Glu	Ser	Ala	
			565					570					575			
Asn	Ala	Phe	Thr	Ser	Ser	Leu	Gly	Asn	Ile	Val	Gly	Val	Arg	Asn	Phe	
		580						585					590			
Ser	Gly	Thr	Ala	Gly	Val	Ile	Ile	Asp	Arg	Phe	Glu	Phe	Ile	Pro	Val	
	595						600					605				
Thr	Ala	Thr	Leu	Glu	Ala	Glu	Tyr	Asn	Leu	Glu	Arg	Ala	Gln	Lys	Ala	

610	615	620
Val Asn Ala Leu Phe Thr Ser Thr Asn Gln Leu Gly Leu Lys Thr Asn		
625	630	635
Val Thr Asp Tyr His Ile Asp Gln Val Ser Asn Leu Val Thr Tyr Leu		640
	645	650
Ser Asp Glu Phe Cys Leu Asp Glu Lys Arg Glu Leu Ser Glu Lys Val		655
	660	665
Lys His Ala Lys Arg Leu Ser Asp Glu Arg Asn Leu Leu Gln Asp Ser		670
	675	680
Asn Phe Lys Asp Ile Asn Arg Gln Pro Glu Arg Gly Trp Gly Gly Ser		685
	690	695
Thr Gly Ile Thr Ile Gln Gly Gly Asp Asp Val Phe Lys Glu Asn Tyr		700
705	710	715
Val Thr Leu Ser Gly Thr Phe Asp Glu Cys Tyr Pro Thr Tyr Leu Tyr		720
	725	730
Gln Lys Ile Asp Glu Ser Lys Leu Lys Ala Phe Thr Arg Tyr Gln Leu		735
	740	745
Arg Gly Tyr Ile Glu Asp Ser Gln Asp Leu Glu Ile Tyr Leu Ile Arg		750
	755	760
Tyr Asn Ala Lys His Glu Thr Val Asn Val Pro Gly Thr Gly Ser Leu		765
	770	775
Trp Pro Leu Ser Ala Gln Ser Pro Ile Gly Lys Cys Gly Glu Pro Asn		780
785	790	795
Arg Cys Ala Pro His Leu Glu Trp Asn Pro Asp Leu Asp Cys Ser Cys		800
	805	810
Arg Asp Gly Glu Lys Cys Ala His His Ser His His Phe Ser Leu Asp		815
	820	825
Ile Asp Val Gly Cys Thr Asp Leu Asn Glu Asp Leu Gly Val Trp Val		830
	835	840
Ile Phe Lys Ile Lys Thr Gln Asp Gly His Ala Arg Leu Gly Asn Leu		845
	850	855
Glu Phe Leu Glu Glu Lys Pro Leu Val Gly Glu Ala Leu Ala Arg Val		860
865	870	875
Lys Arg Ala Glu Lys Lys Trp Arg Asp Lys Arg Glu Lys Leu Glu Trp		880
	885	890
Glu Thr Asn Ile Val Tyr Lys Glu Ala Lys Glu Ser Val Asp Ala Leu		895
	900	905
Phe Val Asn Ser Gln Tyr Asp Gln Leu Gln Ala Asp Thr Asn Ile Ala		910
	915	920
Met Ile His Ala Ala Asp Lys Arg Val His Ser Ile Arg Glu Ala Tyr		925
	930	935
Leu Pro Glu Leu Ser Val Ile Pro Gly Val Asn Ala Ala Ile Phe Glu		940
945	950	955
Glu Leu Glu Gly Arg Ile Phe Thr Ala Phe Ser Leu Tyr Asp Ala Arg		960
	965	970
Asn Val Ile Lys Asn Gly Asp Phe Asn Asn Gly Leu Ser Cys Trp Asn		975
	980	985
Val Lys Gly His Val Asp Val Glu Glu Gln Asn Asn Gln Arg Ser Val		990
	995	1000
Leu Val Val Pro Glu Trp Glu Ala Glu Val Ser Gln Glu Val Arg Val		1005
	1010	1015
Cys Pro Gly Arg Gly Tyr Ile Leu Arg Val Thr Ala Tyr Lys Glu Gly		1020
1025	1030	1035
Tyr Gly Glu Gly Cys Val Thr Ile His Glu Ile Glu Asn Asn Thr Asp		1040
	1045	1050
Glu Leu Lys Phe Ser Asn Cys Val Glu Glu Glu Ile Tyr Pro Asn Asn		1055
	1060	1065
		1070

Thr	Val	Thr	Cys	Asn	Asp	Tyr	Thr	Val	Asn	Gln	Glu	Glu	Tyr	Gly	Gly		
		1075						1080					1085				
Ala	Tyr	Thr	Ser	Arg	Asn	Arg	Gly	Tyr	Asn	Glu	Ala	Pro	Ser	Val	Pro		
	1090					1095					1100						
Ala	Asp	Tyr	Ala	Ser	Val	Tyr	Glu	Glu	Lys	Ser	Tyr	Thr	Asp	Gly	Arg		
1105					1110					1115					1120		
Arg	Glu	Asn	Pro	Cys	Glu	Phe	Asn	Arg	Gly	Tyr	Arg	Asp	Tyr	Thr	Pro		
				1125					1130						1135		
Leu	Pro	Val	Gly	Tyr	Val	Thr	Lys	Glu	Leu	Glu	Tyr	Phe	Pro	Glu	Thr		
		1140						1145					1150				
Asp	Lys	Val	Trp	Ile	Glu	Ile	Gly	Glu	Thr	Glu	Gly	Thr	Phe	Ile	Val		
	1155						1160					1165					
Asp	Ser	Val	Glu	Leu	Leu	Leu	Met	Glu	Glu								
	1170						1175										

<210> 9

<211> 1189

<212> PRT

<213> Bacillus thuringiensis

<400> 9

Met	Glu	Glu	Asn	Asn	Gln	Asn	Gln	Cys	Ile	Pro	Tyr	Asn	Cys	Leu	Ser		
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Asn	Pro	Glu	Glu	Val	Leu	Leu	Asp	Gly	Glu	Arg	Ile	Ser	Thr	Gly	Asn		
		20					25					30					
Ser	Ser	Ile	Asp	Ile	Ser	Leu	Ser	Leu	Val	Gln	Phe	Leu	Val	Ser	Asn		
	35					40					45						
Phe	Val	Pro	Gly	Gly	Gly	Phe	Leu	Val	Gly	Leu	Ile	Asp	Phe	Val	Trp		
50					55					60							
Gly	Ile	Val	Gly	Pro	Ser	Gln	Trp	Asp	Ala	Phe	Leu	Val	Gln	Ile	Glu		
65				70					75						80		
Gln	Leu	Ile	Asn	Glu	Arg	Ile	Ala	Glu	Phe	Ala	Arg	Asn	Ala	Ala	Ile		
			85					90						95			
Ala	Asn	Leu	Glu	Gly	Leu	Gly	Asn	Asn	Phe	Asn	Ile	Tyr	Val	Glu	Ala		
		100					105						110				
Phe	Lys	Glu	Trp	Glu	Glu	Asp	Pro	Asn	Asn	Pro	Ala	Thr	Arg	Thr	Arg		
	115					120						125					
Val	Ile	Asp	Arg	Phe	Arg	Ile	Leu	Asp	Gly	Leu	Leu	Glu	Arg	Asp	Ile		
130						135					140						
Pro	Ser	Phe	Arg	Ile	Ser	Gly	Phe	Glu	Val	Pro	Leu	Leu	Ser	Val	Tyr		
145				150					155						160		
Ala	Gln	Ala	Ala	Asn	Leu	His	Leu	Ala	Ile	Leu	Arg	Asp	Ser	Val	Ile		
			165					170						175			
Phe	Gly	Glu	Arg	Trp	Gly	Leu	Thr	Thr	Ile	Asn	Val	Asn	Glu	Asn	Tyr		
		180					185						190				
Asn	Arg	Leu	Ile	Arg	His	Ile	Asp	Glu	Tyr	Ala	Asp	His	Cys	Ala	Asn		
	195					200						205					
Thr	Tyr	Asn	Arg	Gly	Leu	Asn	Asn	Leu	Pro	Lys	Ser	Thr	Tyr	Gln	Asp		
210						215					220						
Trp	Ile	Thr	Tyr	Asn	Arg	Leu	Arg	Arg	Asp	Leu	Thr	Leu	Thr	Val	Leu		
225				230						235					240		
Asp	Ile	Ala	Ala	Phe	Pro	Asn	Tyr	Asp	Asn	Arg	Arg	Tyr	Pro	Ile			
			245					250						255			
Gln	Pro	Val	Gly	Gln	Leu	Thr	Arg	Glu	Val	Tyr	Thr	Asp	Pro	Leu	Ile		
		260						265					270				
Asn	Phe	Asn	Pro	Gln	Leu	Gln	Ser	Val	Ala	Gln	Leu	Pro	Thr	Phe	Asn		

		275					280					285				
Val	Met	Glu	Ser	Ser	Ala	Ile	Arg	Asn	Pro	His	Leu	Phe	Asp	Ile	Leu	
	290					295					300					
Asn	Asn	Leu	Thr	Ile	Phe	Thr	Asp	Trp	Phe	Ser	Val	Gly	Arg	Asn	Phe	
305					310					315					320	
Tyr	Trp	Gly	Gly	His	Arg	Val	Ile	Ser	Ser	Leu	Ile	Gly	Gly	Gly	Asn	
				325					330					335		
Ile	Thr	Ser	Pro	Ile	Tyr	Gly	Arg	Glu	Ala	Asn	Gln	Glu	Pro	Pro	Arg	
			340					345					350			
Ser	Phe	Thr	Phe	Asn	Gly	Pro	Val	Phe	Arg	Thr	Leu	Ser	Asn	Pro	Thr	
		355					360					365				
Leu	Arg	Leu	Leu	Gln	Gln	Pro	Trp	Pro	Ala	Pro	Pro	Phe	Asn	Leu	Arg	
	370					375					380					
Gly	Val	Glu	Gly	Val	Glu	Phe	Ser	Thr	Pro	Thr	Asn	Ser	Phe	Thr	Tyr	
385					390					395					400	
Arg	Gly	Arg	Gly	Thr	Val	Asp	Ser	Leu	Thr	Glu	Leu	Pro	Pro	Glu	Asp	
				405					410					415		
Asn	Ser	Val	Pro	Pro	Arg	Glu	Gly	Tyr	Ser	His	Arg	Leu	Cys	His	Ala	
			420					425					430			
Thr	Phe	Val	Gln	Arg	Ser	Gly	Thr	Pro	Phe	Leu	Thr	Thr	Gly	Val	Val	
		435					440					445				
Phe	Ser	Trp	Thr	His	Arg	Ser	Ala	Thr	Leu	Thr	Asn	Thr	Ile	Asp	Pro	
	450					455					460					
Glu	Arg	Ile	Asn	Gln	Ile	Pro	Leu	Val	Lys	Gly	Phe	Arg	Val	Trp	Gly	
465					470					475					480	
Gly	Thr	Ser	Val	Ile	Thr	Gly	Pro	Gly	Phe	Thr	Gly	Gly	Asp	Ile	Leu	
				485					490					495		
Arg	Arg	Asn	Thr	Phe	Gly	Asp	Phe	Val	Ser	Leu	Gln	Val	Asn	Ile	Asn	
			500					505					510			
Ser	Pro	Ile	Thr	Gln	Arg	Tyr	Arg	Leu	Arg	Phe	Arg	Tyr	Ala	Ser	Ser	
		515					520					525				
Arg	Asp	Ala	Arg	Val	Ile	Val	Leu	Thr	Gly	Ala	Ala	Ser	Thr	Gly	Val	
	530					535					540					
Gly	Gly	Gln	Val	Ser	Val	Asn	Met	Pro	Leu	Gln	Lys	Thr	Met	Glu	Ile	
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Gly	Glu	Asn	Leu	Thr	Ser	Arg	Thr	Phe	Arg	Tyr	Thr	Asp	Phe	Ser	Asn	
				565					570					575		
Pro	Phe	Ser	Phe	Arg	Ala	Asn	Pro	Asp	Ile	Ile	Gly	Ile	Ser	Glu	Gln	
			580					585					590			
Pro	Leu	Phe	Gly	Ala	Gly	Ser	Ile	Ser	Ser	Gly	Glu	Leu	Tyr	Ile	Asp	
		595					600					605				
Lys	Ile	Glu	Ile	Ile	Leu	Ala	Asp	Ala	Thr	Phe	Glu	Ala	Glu	Ser	Asp	
	610					615					620					
Leu	Glu	Arg	Ala	Gln	Lys	Ala	Val	Asn	Ala	Leu	Phe	Thr	Ser	Ser	Asn	
625					630					635						


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<210> 10
<211> 719
<212> PRT
<213> Bacillus thuringiensis
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Met 1	Lys	Leu	Lys	Asn 5	Gln	Asp	Lys	His	Gln 10	Ser	Phe	Ser	Ser	Asn 15	Ala
Lys	Val	Asp	Lys 20	Ile	Ser	Thr	Asp	Ser 25	Leu	Lys	Asn	Glu 30	Thr	Asp	Ile
Glu	Leu	Gln	Asn 35	Ile	Asn	His	Glu 40	Asp	Cys	Leu	Lys	Met 45	Ser	Glu	Tyr
Glu	Asn	Val	Glu 50	Pro	Phe	Val	Ser 55	Ala	Ser	Thr	Ile 60	Gln	Thr	Gly	Ile
Gly 65	Ile	Ala	Gly 70	Lys	Ile	Leu	Gly 75	Thr	Leu	Gly 80	Val	Pro	Phe	Ala	Gly
Gln	Val	Ala	Ser 85	Leu	Tyr	Ser	Phe 90	Ile	Leu	Gly 95	Glu	Leu	Trp	Pro	Lys
Gly	Lys	Asn	Gln 100	Trp	Glu	Ile	Phe 105	Met	Glu	His 110	Val	Glu	Glu	Ile	Ile
Asn	Gln	Lys 115	Ile	Ser	Thr	Tyr	Ala 120	Arg	Asn	Lys 125	Ala	Leu	Thr	Asp	Leu
Lys	Gly 130	Leu	Gly	Asp	Ala	Leu 135	Ala	Val	Tyr	His 140	Asp	Ser	Leu	Glu	Ser
Trp 145	Val	Gly	Asn 150	Arg	Asn	Asn	Thr	Arg	Ala	Arg 155	Ser	Val	Val	Lys	Ser
Gln	Tyr	Ile	Ala 165	Leu	Glu	Leu	Met 170	Phe	Val	Gln 175	Lys	Leu	Pro	Ser	Phe
Ala	Val	Ser 180	Gly	Glu	Glu	Val	Pro 185	Leu	Leu	Pro 190	Ile	Tyr	Ala	Gln	Ala
Ala	Asn 195	Leu	His	Leu	Leu	Leu	Leu 200	Arg	Asp	Ala 205	Ser	Ile	Phe	Gly	Lys
Glu	Trp 210	Gly	Leu	Ser	Ser	Ser 215	Glu	Ile	Ser	Thr 220	Phe	Tyr	Asn	Arg	Gln
Val 225	Glu	Arg	Ala 230	Gly	Asp	Tyr	Ser	Asp	His 235	Cys	Val	Lys	Trp	Tyr	Ser
Thr	Gly	Leu	Asn 245	Asn	Leu	Arg	Gly	Thr	Asn 250	Ala	Glu	Ser	Trp	Val	Arg
Tyr	Asn	Gln 260	Phe	Arg	Arg	Asp	Met 265	Thr	Leu 270	Met	Val	Leu	Asp	Leu	Val
Ala	Leu 275	Phe	Pro	Ser	Tyr	Asp	Thr 280	Gln	Met	Tyr 285	Pro	Ile	Lys	Thr	Thr
Ala	Gln 290	Leu	Thr	Arg	Glu	Val 295	Tyr	Thr	Asp	Ala 300	Ile	Gly	Thr	Val	His
Pro 305	His	Pro	Ser 310	Phe	Thr	Ser	Thr	Thr	Trp 315	Tyr	Asn	Asn	Asn	Ala	Pro
Ser	Phe	Ser	Ala 325	Ile	Glu	Ala	Ala 330	Val	Val	Arg 335	Asn	Pro	His	Leu	Leu
Asp	Phe	Leu 340	Glu	Gln	Val	Thr	Ile 345	Tyr	Ser	Leu 350	Leu	Ser	Arg	Trp	Ser
Asn	Thr 355	Gln	Tyr	Met	Asn	Met 360	Trp	Gly	Gly	His 365	Lys	Leu	Glu	Phe	Arg
Thr	Ile 370	Gly	Gly	Thr	Leu	Asn 375	Ile	Ser	Thr	Gln 380	Gly	Ser	Thr	Asn	Thr

Ser Ile Asn Pro Val Thr Leu Pro Phe Thr Ser Arg Asp Val Tyr Arg
 385 390 395 400
 Thr Glu Ser Leu Ala Gly Leu Asn Leu Phe Leu Thr Gln Pro Val Asn
 405 410 415
 Gly Val Pro Arg Val Asp Phe His Trp Lys Phe Val Thr His Pro Ile
 420 425 430
 Ala Ser Asp Asn Phe Tyr Tyr Pro Gly Tyr Ala Gly Ile Gly Thr Gln
 435 440 445
 Leu Gln Asp Ser Glu Asn Glu Leu Pro Pro Glu Ala Thr Gly Gln Pro
 450 455 460
 Asn Tyr Glu Ser Tyr Ser His Arg Leu Ser His Ile Gly Leu Ile Ser
 465 470 475 480
 Ala Ser His Val Lys Ala Leu Val Tyr Ser Trp Thr His Arg Ser Ala
 485 490 495
 Asp Arg Thr Asn Thr Ile Glu Pro Asn Ser Ile Thr Gln Ile Pro Leu
 500 505 510
 Val Lys Ala Phe Asn Leu Ser Ser Gly Ala Ala Val Val Arg Gly Pro
 515 520 525
 Gly Phe Thr Gly Gly Asp Ile Leu Arg Arg Thr Asn Thr Gly Thr Phe
 530 535 540
 Gly Asp Ile Arg Val Asn Ile Asn Pro Pro Phe Ala Gln Arg Tyr Arg
 545 550 555 560
 Val Arg Ile Arg Tyr Ala Ser Thr Thr Asp Leu Gln Phe His Thr Ser
 565 570 575
 Ile Asn Gly Lys Ala Ile Asn Gln Gly Asn Phe Ser Ala Thr Met Asn
 580 585 590
 Arg Gly Glu Asp Leu Asp Tyr Lys Thr Phe Arg Thr Val Gly Phe Thr
 595 600 605
 Thr Pro Phe Ser Phe Leu Asp Val Gln Ser Thr Phe Thr Ile Gly Ala
 610 615 620
 Trp Asn Phe Ser Ser Gly Asn Glu Val Tyr Ile Asp Arg Ile Glu Phe
 625 630 635 640
 Val Pro Val Glu Val Thr Tyr Glu Ala Glu Tyr Asp Phe Glu Lys Ala
 645 650 655
 Gln Glu Lys Val Thr Ala Leu Phe Thr Ser Thr Asn Pro Arg Gly Leu
 660 665 670
 Lys Thr Asp Val Lys Asp Tyr His Ile Asp Gln Val Ser Asn Leu Val
 675 680 685
 Glu Ser Leu Ser Asp Glu Phe Tyr Leu Asp Glu Lys Arg Glu Leu Phe
 690 695 700
 Glu Ile Val Lys Tyr Ala Lys Gln Leu His Ile Glu Arg Asn Met
 705 710 715

<210> 11

<211> 652

<212> PRT

<213> *Bacillus thuringiensis*

<400> 11

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 His Asp Thr Ile Lys Thr Thr Glu Asn Asn Glu Val Pro Thr Asn His
 20 25 30
 Val Gln Tyr Pro Leu Ala Glu Thr Pro Asn Pro Thr Leu Glu Asp Leu
 35 40 45
 Asn Tyr Lys Glu Phe Leu Arg Met Thr Ala Asp Asn Asn Thr Glu Ala

50		55		60
Leu Asp Ser Ser Thr Thr Lys Asp Val Ile Gln Lys Gly Ile Ser Val				
65		70		80
Val Gly Asp Leu Leu Gly Val Val Gly Phe Pro Phe Gly Gly Ala Leu				
	85		90	95
Val Ser Phe Tyr Thr Asn Phe Leu Asn Thr Ile Trp Pro Ser Glu Asp				
	100		105	110
Pro Trp Lys Ala Phe Met Glu Gln Val Glu Ala Leu Met Asp Gln Lys				
	115		120	125
Ile Ala Asp Tyr Ala Lys Asn Lys Ala Leu Ala Glu Leu Gln Gly Leu				
	130		135	140
Gln Asn Asn Val Glu Asp Tyr Val Ser Ala Leu Ser Ser Trp Gln Lys				
145		150		160
Asn Pro Val Ser Ser Arg Asn Pro His Ser Gln Gly Arg Ile Arg Glu				
	165		170	175
Leu Phe Ser Gln Ala Glu Ser His Phe Arg Asn Ser Met Pro Ser Phe				
	180		185	190
Ala Ile Ser Gly Tyr Glu Val Leu Phe Leu Thr Thr Tyr Ala Gln Ala				
	195		200	205
Ala Asn Thr His Leu Phe Leu Leu Lys Asp Ala Gln Ile Tyr Gly Glu				
	210		215	220
Glu Trp Gly Tyr Glu Lys Glu Asp Ile Ala Glu Phe Tyr Lys Arg Gln				
225		230		240
Leu Lys Leu Thr Gln Glu Tyr Thr Asp His Cys Val Lys Trp Tyr Asn				
	245		250	255
Val Gly Leu Asp Lys Leu Arg Gly Ser Ser Tyr Glu Ser Trp Val Asn				
	260		265	270
Phe Asn Arg Tyr Arg Arg Glu Met Thr Leu Thr Val Leu Asp Leu Ile				
	275		280	285
Ala Leu Phe Pro Leu Tyr Asp Val Arg Leu Tyr Pro Lys Glu Val Lys				
	290		295	300
Thr Glu Leu Thr Arg Asp Val Leu Thr Asp Pro Ile Val Gly Val Asn				
305		310		320
Asn Leu Arg Gly Tyr Gly Thr Thr Phe Ser Asn Ile Glu Asn Tyr Ile				
	325		330	335
Arg Lys Pro His Leu Phe Asp Tyr Leu His Arg Ile Gln Phe His Thr				
	340		345	350
Arg Phe Gln Pro Gly Tyr Tyr Gly Asn Asp Ser Phe Asn Tyr Trp Ser				
	355		360	365
Gly Asn Tyr Val Ser Thr Arg Pro Ser Ile Gly Ser Asn Asp Ile Ile				
	370		375	380
Thr Ser Pro Phe Tyr Gly Asn Lys Ser Ser Glu Pro Val Gln Asn Leu				
385		390		400
Glu Phe Asn Gly Glu Lys Val Tyr Arg Ala Val Ala Asn Thr Asn Leu				
	405		410	415
Ala Val Trp Pro Ser Ala Val Tyr Ser Gly Val Thr Lys Val Glu Phe				
	420		425	430
Ser Gln Tyr Asn Asp Gln Thr Asp Glu Ala Ser Thr Gln Thr Tyr Asp				
	435		440	445
Ser Lys Arg Asn Val Gly Ala Val Ser Trp Asp Ser Ile Asp Gln Leu				
	450		455	460
Pro Pro Glu Thr Thr Asp Glu Pro Leu Glu Lys Gly Tyr Ser His Gln				
465		470		480
Leu Asn Tyr Val Met Cys Phe Leu Met Gln Gly Ser Arg Gly Thr Ile				
	485		490	495
Pro Val Leu Thr Trp Thr His Lys Ser Val Asp Phe Phe Asn Met Ile				
	500		505	510

Asp	Ser	Lys	Lys	Ile	Thr	Gln	Leu	Pro	Leu	Val	Lys	Ala	Tyr	Lys	Leu
		515					520					525			
Gln	Ser	Gly	Ala	Ser	Val	Val	Ala	Gly	Pro	Arg	Phe	Thr	Gly	Gly	Asp
		530					535					540			
Ile	Ile	Gln	Cys	Thr	Glu	Asn	Gly	Ser	Ala	Ala	Thr	Ile	Tyr	Val	Thr
545					550					555					560
Pro	Asp	Val	Ser	Tyr	Ser	Gln	Lys	Tyr	Arg	Ala	Arg	Ile	His	Tyr	Ala
				565					570					575	
Ser	Thr	Ser	Gln	Ile	Thr	Phe	Thr	Leu	Ser	Leu	Asp	Gly	Ala	Pro	Phe
			580						585				590		
Asn	Gln	Tyr	Tyr	Phe	Asp	Lys	Thr	Ile	Asn	Lys	Gly	Asp	Thr	Leu	Thr
		595					600					605			
Tyr	Asn	Ser	Phe	Asn	Leu	Ala	Ser	Phe	Ser	Thr	Pro	Phe	Glu	Leu	Ser
		610				615					620				
Gly	Asn	Asn	Leu	Gln	Ile	Gly	Val	Thr	Gly	Leu	Ser	Ala	Gly	Asp	Lys
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Val	Tyr	Ile	Asp	Lys	Ile	Glu	Phe	Ile	Pro	Val	Asn				
				645					650						

<210> 12

<211> 659

<212> PRT

<213> *Bacillus thuringiensis*

<400> 12

Met	Ile	Arg	Met	Gly	Gly	Arg	Lys	Met	Asn	Pro	Asn	Asn	Arg	Ser	Glu
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Tyr	Asp	Thr	Ile	Lys	Val	Thr	Pro	Asn	Ser	Glu	Leu	Pro	Thr	Asn	His
			20					25					30		
Asn	Gln	Tyr	Pro	Leu	Ala	Asp	Asn	Pro	Asn	Ser	Thr	Leu	Glu	Glu	Leu
		35					40					45			
Asn	Tyr	Lys	Glu	Phe	Leu	Arg	Met	Thr	Ala	Asp	Asn	Ser	Thr	Glu	Val
		50				55					60				
Leu	Asp	Ser	Ser	Thr	Val	Lys	Asp	Ala	Val	Gly	Thr	Gly	Ile	Ser	Val
65					70					75					80
Val	Gly	Gln	Ile	Leu	Gly	Val	Val	Gly	Val	Pro	Phe	Ala	Gly	Ala	Leu
				85					90					95	
Thr	Ser	Phe	Tyr	Gln	Ser	Phe	Leu	Asn	Ala	Ile	Trp	Pro	Ser	Asp	Ala
			100					105					110		
Asp	Pro	Trp	Lys	Ala	Phe	Met	Ala	Gln	Val	Glu	Val	Leu	Ile	Asp	Lys
		115				120						125			
Lys	Ile	Glu	Glu	Tyr	Ala	Lys	Ser	Lys	Ala	Leu	Ala	Glu	Leu	Gln	Gly
		130				135					140				
Leu	Gln	Asn	Asn	Phe	Glu	Asp	Tyr	Val	Asn	Ala	Leu	Asp	Ser	Trp	Lys
145					150					155					160
Lys	Ala	Pro	Val	Asn	Leu	Arg	Ser	Arg	Arg	Ser	Gln	Asp	Arg	Ile	Arg
				165					170					175	
Glu	Leu	Phe	Ser	Gln	Ala	Glu	Ser	His	Phe	Arg	Asn	Ser	Met	Pro	Ser
			180					185					190		
Phe	Ala	Val	Ser	Lys	Phe	Glu	Val	Leu	Phe	Leu	Pro	Thr	Tyr	Ala	Gln
		195					200					205			
Ala	Ala	Asn	Thr	His	Leu	Leu	Leu	Leu	Lys	Asp	Ala	Gln	Val	Phe	Gly
		210				215					220				
Glu	Glu	Trp	Gly	Tyr	Ser	Ser	Glu	Asp	Ile	Ala	Glu	Phe	Tyr	Gln	Arg
225					230					235					240
Gln	Leu	Lys	Leu	Thr	Gln	Gln	Tyr	Thr	Asp	His	Cys	Val	Asn	Trp	Tyr

<212> PRT

<213> *Bacillus thuringiensis*

<400> 13

Met	Asn	Pro	Asn	Asn	Arg	Ser	Glu	His	Asp	Thr	Ile	Lys	Val	Thr	Pro
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Asn	Ser	Glu	Leu	Gln	Thr	Asn	His	Asn	Gln	Tyr	Pro	Leu	Ala	Asp	Asn
			20					25					30		
Pro	Asn	Ser	Thr	Leu	Glu	Glu	Leu	Asn	Tyr	Lys	Glu	Phe	Leu	Arg	Met
		35					40					45			
Thr	Glu	Asp	Ser	Ser	Thr	Glu	Val	Leu	Asp	Asn	Ser	Thr	Val	Lys	Asp
	50					55					60				
Ala	Val	Gly	Thr	Gly	Ile	Ser	Val	Val	Gly	Gln	Ile	Leu	Gly	Val	Val
65					70					75					80
Gly	Val	Pro	Phe	Ala	Gly	Ala	Leu	Thr	Ser	Phe	Tyr	Gln	Ser	Phe	Leu
				85					90					95	
Asn	Thr	Ile	Trp	Pro	Ser	Asp	Ala	Asp	Pro	Trp	Lys	Ala	Phe	Met	Ala
			100					105					110		
Gln	Val	Glu	Val	Leu	Ile	Asp	Lys	Lys	Ile	Glu	Glu	Tyr	Ala	Lys	Ser
		115					120					125			
Lys	Ala	Leu	Ala	Glu	Leu	Gln	Gly	Leu	Gln	Asn	Asn	Phe	Glu	Asp	Tyr
	130					135					140				
Val	Asn	Ala	Leu	Asn	Ser	Trp	Lys	Lys	Thr	Pro	Leu	Ser	Leu	Arg	Ser
145					150					155					160
Lys	Arg	Ser	Gln	Asp	Arg	Ile	Arg	Glu	Leu	Phe	Ser	Gln	Ala	Glu	Ser
				165					170					175	
His	Phe	Arg	Asn	Ser	Met	Pro	Ser	Phe	Ala	Val	Ser	Lys	Phe	Glu	Val
			180					185					190		
Leu	Phe	Leu	Pro	Thr	Tyr	Ala	Gln	Ala	Ala	Asn	Thr	His	Leu	Leu	Leu
		195					200					205			
Leu	Lys	Asp	Ala	Gln	Val	Phe	Gly	Glu	Glu	Trp	Gly	Tyr	Ser	Ser	Glu
	210					215					220				
Asp	Val	Ala	Glu	Phe	Tyr	His	Arg	Gln	Leu	Lys	Leu	Thr	Gln	Gln	Tyr
225					230					235					240
Thr	Asp	His	Cys	Val	Asn	Trp	Tyr	Asn	Val	Gly	Leu	Asn	Gly	Leu	Arg
				245					250					255	
Gly	Ser	Thr	Tyr	Asp	Ala	Trp	Val	Lys	Phe	Asn	Arg	Phe	Arg	Arg	Glu
			260					265					270		
Met	Thr	Leu	Thr	Val	Leu	Asp	Leu	Ile	Val	Leu	Phe	Pro	Phe	Tyr	Asp
		275					280					285			
Ile	Arg	Leu	Tyr	Ser	Lys	Gly	Val	Lys	Thr	Glu	Leu	Thr	Arg	Asp	Ile
	290					295					300				
Phe	Thr	Asp	Pro	Ile	Phe	Ser	Leu	Asn	Thr	Leu	Gln	Glu	Tyr	Gly	Pro
305					310					315					320
Thr	Phe	Leu	Ser	Ile	Glu	Asn	Ser	Ile	Arg	Lys	Pro	His	Leu	Phe	Asp
				325					330					335	
Tyr	Leu	Gln	Gly	Ile	Glu	Phe	His	Thr	Arg	Leu	Gln	Pro	Gly	Tyr	Phe
		340						345					350		
Gly	Lys	Asp	Ser	Phe	Asn	Tyr	Trp	Ser	Gly	Asn	Tyr	Val	Glu	Thr	Arg
		355					360					365			
Pro	Ser	Ile	Gly	Ser	Ser	Lys	Thr	Ile	Thr	Ser	Pro	Phe	Tyr	Gly	Asp
		370				375					380				
Lys	Ser	Thr	Glu	Pro	Val	Gln	Lys	Leu	Ser	Phe	Asp	Gly	Gln	Lys	Val
385					390					395					400
Tyr	Arg	Thr	Ile	Ala	Asn	Thr	Asp	Val	Ala	Ala	Trp	Pro	Asn	Gly	Lys
				405					410					415	
Val	Tyr	Leu	Gly	Val	Thr	Lys	Val	Asp	Phe	Ser	Gln	Tyr	Asp	Asp	Gln

			420					425					430						
Lys	Asn	Glu	Thr	Ser	Thr	Gln	Thr	Tyr	Asp	Ser	Lys	Arg	Asn	Asn	Gly				
		435						440					445						
His	Val	Ser	Ala	Gln	Asp	Ser	Ile	Asp	Gln	Leu	Pro	Pro	Glu	Thr	Thr				
		450						455					460						
Asp	Glu	Pro	Leu	Glu	Lys	Ala	Tyr	Ser	His	Gln	Leu	Asn	Tyr	Ala	Glu				
465						470				475					480				
Cys	Phe	Leu	Met	Gln	Asp	Arg	Arg	Gly	Thr	Ile	Pro	Phe	Phe	Thr	Trp				
				485					490					495					
Thr	His	Arg	Ser	Val	Asp	Phe	Phe	Asn	Thr	Ile	Asp	Ala	Glu	Lys	Ile				
			500					505					510						
Thr	Gln	Leu	Pro	Val	Val	Lys	Ala	Tyr	Ala	Leu	Ser	Ser	Gly	Ala	Ser				
		515						520					525						
Ile	Ile	Glu	Gly	Pro	Gly	Phe	Thr	Gly	Gly	Asn	Leu	Leu	Phe	Leu	Lys				
		530				535					540								
Glu	Ser	Ser	Asn	Ser	Ile	Ala	Lys	Phe	Lys	Val	Thr	Leu	Asn	Ser	Ala				
545					550					555					560				
Ala	Leu	Leu	Gln	Arg	Tyr	Arg	Val	Arg	Ile	Arg	Tyr	Ala	Ser	Thr	Thr				
				565					570					575					
Asn	Leu	Arg	Leu	Phe	Val	Gln	Asn	Ser	Asn	Asn	Asp	Phe	Leu	Val	Ile				
			580					585					590						
Tyr	Ile	Asn	Lys	Thr	Met	Asn	Lys	Asp	Asp	Asp	Leu	Thr	Tyr	Gln	Thr				
		595					600					605							
Phe	Asp	Leu	Ala	Thr	Thr	Asn	Ser	Asn	Met	Gly	Phe	Ser	Gly	Asp	Lys				
		610				615				620									
Asn	Glu	Leu	Ile	Ile	Gly	Ala	Glu	Ser	Phe	Val	Ser	Asn	Glu	Lys	Ile				
625					630					635					640				
Tyr	Ile	Asp	Lys	Ile	Glu	Phe	Ile	Pro	Val	Gln	Leu								
				645				650											

<210> 14

<211> 1180

<212> PRT

<213> Bacillus thuringiensis

<400> 14

Met	Asn	Pro	Tyr	Gln	Asn	Lys	Asn	Glu	Tyr	Glu	Thr	Leu	Asn	Ala	Ser				
1				5				10						15					
Gln	Lys	Lys	Leu	Asn	Ile	Ser	Asn	Asn	Tyr	Thr	Arg	Tyr	Pro	Ile	Glu				
			20					25					30						
Asn	Ser	Pro	Lys	Gln	Leu	Leu	Gln	Ser	Thr	Asn	Tyr	Lys	Asp	Trp	Leu				
		35					40					45							
Asn	Met	Cys	Gln	Gln	Asn	Gln	Gln	Tyr	Gly	Gly	Asp	Phe	Glu	Thr	Phe				
50					55					60									
Ile	Asp	Ser	Gly	Glu	Leu	Ser	Ala	Tyr	Thr	Ile	Val	Val	Gly	Thr	Val				
65					70					75				80					
Leu	Thr	Gly	Phe	Gly	Phe	Thr	Thr	Pro	Leu	Gly	Leu	Ala	Leu	Ile	Gly				
			85					90					95						
Phe	Gly	Thr	Leu	Ile	Pro	Val	Leu	Phe	Pro	Ala	Gln	Asp	Gln	Ser	Asn				
		100						105					110						
Thr	Trp	Ser	Asp	Phe	Ile	Thr	Gln	Thr	Lys	Asn	Ile	Ile	Lys	Lys	Glu				
		115					120					125							
Ile	Ala	Ser	Thr	Tyr	Ile	Ser	Asn	Ala	Asn	Lys	Ile	Leu	Asn	Arg	Ser				
	130					135					140								
Phe	Asn	Val	Ile	Ser	Thr	Tyr	His	Asn	His	Leu	Lys	Thr	Trp	Glu	Asn				
145					150					155					160				

Asn	Pro	Asn	Pro	Gln	Asn	Thr	Gln	Asp	Val	Arg	Thr	Gln	Ile	Gln	Leu
				165					170					175	
Val	His	Tyr	His	Phe	Gln	Asn	Val	Ile	Pro	Glu	Leu	Val	Asn	Ser	Cys
			180					185					190		
Pro	Pro	Asn	Pro	Ser	Asp	Cys	Asp	Tyr	Tyr	Asn	Ile	Leu	Val	Leu	Ser
		195					200					205			
Ser	Tyr	Ala	Gln	Ala	Ala	Asn	Leu	His	Leu	Thr	Val	Leu	Asn	Gln	Ala
	210					215					220				
Val	Lys	Phe	Glu	Ala	Tyr	Leu	Lys	Asn	Asn	Arg	Gln	Phe	Asp	Tyr	Leu
225					230					235					240
Glu	Pro	Leu	Pro	Thr	Ala	Ile	Asp	Tyr	Tyr	Pro	Val	Leu	Thr	Lys	Ala
				245					250					255	
Ile	Glu	Asp	Tyr	Thr	Asn	Tyr	Cys	Val	Thr	Thr	Tyr	Lys	Lys	Gly	Leu
		260						265					270		
Asn	Leu	Ile	Lys	Thr	Thr	Pro	Asp	Ser	Asn	Leu	Asp	Gly	Asn	Ile	Asn
		275					280					285			
Trp	Asn	Thr	Tyr	Asn	Thr	Tyr	Arg	Thr	Lys	Met	Thr	Thr	Ala	Val	Leu
	290					295					300				
Asp	Leu	Val	Ala	Leu	Phe	Pro	Asn	Tyr	Asp	Val	Gly	Lys	Tyr	Pro	Ile
305					310					315					320
Gly	Val	Gln	Ser	Glu	Leu	Thr	Arg	Glu	Ile	Tyr	Gln	Val	Leu	Asn	Phe
				325					330					335	
Glu	Glu	Ser	Pro	Tyr	Lys	Tyr	Tyr	Asp	Phe	Gln	Tyr	Gln	Glu	Asp	Ser
			340					345					350		
Leu	Thr	Arg	Arg	Pro	His	Leu	Phe	Thr	Trp	Leu	Asp	Ser	Leu	Asn	Phe
		355					360					365			
Tyr	Glu	Lys	Ala	Gln	Thr	Thr	Pro	Asn	Asn	Phe	Phe	Thr	Ser	His	Tyr
	370					375					380				
Asn	Met	Phe	His	Tyr	Thr	Leu	Asp	Asn	Ile	Ser	Gln	Lys	Ser	Ser	Val
385					390					395					400
Phe	Gly	Asn	His	Asn	Val	Thr	Asp	Lys	Leu	Lys	Ser	Leu	Gly	Leu	Ala
				405					410					415	
Thr	Asn	Ile	Tyr	Ile	Phe	Leu	Leu	Asn	Val	Ile	Ser	Leu	Asp	Asn	Lys
			420					425					430		
Tyr	Leu	Asn	Asp	Tyr	Asn	Asn	Ile	Ser	Lys	Met	Asp	Phe	Phe	Ile	Thr
		435					440					445			
Asn	Gly	Thr	Arg	Leu	Leu	Glu	Lys	Glu	Leu	Thr	Ala	Gly	Ser	Gly	Gln
	450					455					460				
Ile	Thr	Tyr	Asp	Val	Asn	Lys	Asn	Ile	Phe	Gly	Leu	Pro	Ile	Leu	Lys
465					470					475					480
Arg	Arg	Glu	Asn	Gln	Gly	Asn	Pro	Thr	Leu	Phe	Pro	Thr	Tyr	Asp	Asn
				485					490					495	
Tyr	Ser	His	Ile	Leu	Ser	Phe	Ile	Lys	Ser	Leu	Ser	Ile	Pro	Ala	Thr
			500					505					510		
Tyr	Lys	Thr	Gln	Val	Tyr	Thr	Phe	Ala	Trp	Thr	His	Ser	Ser	Val	Asp
		515					520					525			
Pro	Lys	Asn	Thr	Ile	Tyr	Thr	His	Leu	Thr	Thr	Gln	Ile	Pro	Ala	Val
	530					535					540				
Lys	Ala	Asn	Ser	Leu	Gly	Thr	Ala	Ser	Lys	Val	Val	Gln	Gly	Pro	Gly
545					550					555					560
His	Thr	Gly	Gly	Asp	Leu	Ile	Asp	Phe	Lys	Asp	His	Phe	Lys	Ile	Thr
				565					570					575	
Cys	Gln	His	Ser	Asn	Phe	Gln	Gln	Ser	Tyr	Phe	Ile	Arg	Ile	Arg	Tyr
			580					585					590		
Ala	Ser	Asn	Gly	Ser	Ala	Asn	Thr	Arg	Ala	Val	Ile	Asn	Leu	Ser	Ile
		595					600					605			
Pro	Gly	Val	Ala	Glu	Leu	Gly	Met	Ala	Leu	Asn	Pro	Thr	Phe	Ser	Gly

610		615		620
Thr Asp Tyr Thr Asn	Leu Lys Tyr Lys Asp	Phe Gln Tyr Leu Glu Phe		
625	630	635		640
Ser Asn Glu Val Lys	Phe Ala Pro Asn Gln	Asn Ile Ser Leu Val Phe		
	645	650		655
Asn Arg Ser Asp Val	Tyr Thr Asn Thr Thr	Val Leu Ile Asp Lys Ile		
	660	665		670
Glu Phe Leu Pro Ile	Thr Arg Ser Ile Arg	Glu Asp Arg Glu Lys Gln		
	675	680		685
Lys Leu Glu Thr Val	Gln Gln Ile Ile Asn	Thr Phe Tyr Ala Asn Pro		
	690	695		700
Ile Lys Asn Thr Leu	Gln Ser Glu Leu Thr	Asp Tyr Asp Ile Asp Gln		
705	710	715		720
Ala Ala Asn Leu Val	Glu Cys Ile Ser Glu	Leu Tyr Pro Lys Glu		
	725	730		735
Lys Met Leu Leu Leu	Asp Glu Val Lys Asn	Ala Lys Gln Leu Ser Gln		
	740	745		750
Ser Arg Asn Val Leu	Gln Asn Gly Asp Phe	Glu Ser Ala Thr Leu Gly		
	755	760		765
Trp Thr Thr Ser Asp	Asn Ile Thr Ile Gln	Glu Asp Asp Pro Ile Phe		
	770	775		780
Lys Gly His Tyr Leu	His Met Ser Gly Ala	Arg Asp Ile Asp Gly Thr		
785	790	795		800
Ile Phe Pro Thr Tyr	Ile Phe Gln Lys Ile	Asp Glu Ser Lys Leu Lys		
	805	810		815
Pro Tyr Thr Arg Tyr	Leu Val Arg Gly Phe	Val Gly Ser Ser Lys Asp		
	820	825		830
Val Glu Leu Val Val	Ser Arg Tyr Gly Glu	Glu Ile Asp Ala Ile Met		
	835	840		845
Asn Val Pro Ala Asp	Leu Asn Tyr Leu Tyr	Pro Ser Thr Phe Asp Cys		
	850	855		860
Glu Gly Ser Asn Arg	Cys Glu Thr Ser Ala	Val Pro Ala Asn Ile Gly		
865	870	875		880
Asn Thr Ser Asp Met	Leu Tyr Ser Cys Gln	Tyr Asp Thr Gly Lys Lys		
	885	890		895
His Val Val Cys Gln	Asp Ser His Gln Phe	Ser Phe Thr Ile Asp Thr		
	900	905		910
Gly Ala Leu Asp Thr	Asn Glu Asn Ile Gly	Val Trp Val Met Phe Lys		
	915	920		925
Ile Ser Ser Pro Asp	Gly Tyr Ala Ser Leu	Asp Asn Leu Glu Val Ile		
	930	935		940
Glu Glu Gly Pro Ile	Asp Gly Glu Ala Leu	Ser Arg Val Lys His Met		
945	950	955		960
Glu Lys Lys Trp Asn	Asp Gln Met Glu Ala	Lys Arg Ser Glu Thr Gln		
	965	970		975
Gln Ala Tyr Asp Val	Ala Lys Gln Ala Ile	Asp Ala Leu Phe Thr Asn		
	980	985		990
Val Gln Asp Glu Ala	Leu Gln Phe Asp Thr	Thr Leu Ala Gln Ile Gln		
	995	1000		1005
Tyr Ala Glu Tyr Leu	Val Gln Ser Ile Pro	Tyr Val Tyr Asn Asp Trp		
	1010	1015		1020
Leu Ser Asp Val Pro	Gly Met Asn Tyr Asp	Ile Tyr Val Glu Leu Asp		
1025	1030	1035		1040
Ala Arg Val Ala Gln	Ala Arg Tyr Leu Tyr	Asp Thr Arg Asn Ile Ile		
	1045	1050		1055
Lys Asn Gly Asp Phe	Thr Gln Gly Val Met	Gly Trp His Val Thr Gly		
	1060	1065		1070

Asn	Ala	Asp	Val	Gln	Gln	Ile	Asp	Gly	Val	Ser	Val	Leu	Val	Leu	Ser
		1075						1080					1085		
Asn	Trp	Ser	Ala	Gly	Val	Ser	Gln	Asn	Val	His	Leu	Gln	His	Asn	His
		1090					1095					1100			
Gly	Tyr	Val	Leu	Arg	Val	Ile	Ala	Lys	Lys	Glu	Gly	Pro	Gly	Asn	Gly
		1105			1110					1115					1120
Tyr	Val	Thr	Leu	Met	Asp	Cys	Glu	Glu	Asn	Gln	Glu	Lys	Leu	Thr	Phe
				1125					1130						1135
Thr	Ser	Cys	Glu	Glu	Gly	Tyr	Ile	Thr	Lys	Thr	Val	Asp	Val	Phe	Pro
			1140					1145					1150		
Asp	Thr	Asp	Arg	Val	Arg	Ile	Glu	Ile	Gly	Glu	Thr	Glu	Gly	Ser	Phe
		1155					1160					1165			
Tyr	Ile	Glu	Ser	Ile	Glu	Leu	Ile	Cys	Met	Asn	Glu				
		1170					1175				1180				

<210> 15

<211> 475

<212> PRT

<213> *Bacillus thuringiensis*

<400> 15

Met	Ile	Ile	Asp	Ser	Lys	Thr	Thr	Leu	Pro	Arg	His	Ser	Leu	Ile	His
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Thr	Ile	Lys	Leu	Asn	Ser	Asn	Lys	Lys	Tyr	Gly	Pro	Gly	Asp	Met	Thr
			20					25					30		
Asn	Gly	Asn	Gln	Phe	Ile	Ile	Ser	Lys	Gln	Glu	Trp	Ala	Thr	Ile	Gly
		35				40						45			
Ala	Tyr	Ile	Gln	Thr	Gly	Leu	Gly	Leu	Pro	Val	Asn	Glu	Gln	Gln	Leu
	50					55					60				
Arg	Thr	His	Val	Asn	Leu	Ser	Gln	Asp	Ile	Ser	Ile	Pro	Ser	Asp	Phe
	65				70					75				80	
Ser	Gln	Leu	Tyr	Asp	Val	Tyr	Cys	Ser	Asp	Lys	Thr	Ser	Ala	Glu	Trp
				85					90					95	
Trp	Asn	Lys	Asn	Leu	Tyr	Pro	Leu	Ile	Ile	Lys	Ser	Ala	Asn	Asp	Ile
			100					105					110		
Ala	Ser	Tyr	Gly	Phe	Lys	Val	Ala	Gly	Asp	Pro	Ser	Ile	Lys	Lys	Asp
		115					120					125			
Gly	Tyr	Phe	Lys	Lys	Leu	Gln	Asp	Glu	Leu	Asp	Asn	Ile	Val	Asp	Asn
	130					135					140				
Asn	Ser	Asp	Asp	Asp	Ala	Ile	Ala	Lys	Ala	Ile	Lys	Asp	Phe	Lys	Ala
	145				150					155				160	
Arg	Cys	Gly	Ile	Leu	Ile	Lys	Glu	Ala	Lys	Gln	Tyr	Glu	Glu	Ala	Ala
				165				170						175	
Lys	Asn	Ile	Val	Thr	Ser	Leu	Asp	Gln	Phe	Leu	His	Gly	Asp	Gln	Lys
			180					185					190		
Lys	Leu	Glu	Gly	Val	Ile	Asn	Ile	Gln	Lys	Arg	Leu	Lys	Glu	Val	Gln
		195					200					205			
Thr	Ala	Leu	Asn	Gln	Ala	His	Gly	Glu	Ser	Ser	Pro	Ala	His	Lys	Glu
	210					215					220				
Leu	Leu	Glu	Lys	Val	Lys	Asn	Leu	Lys	Thr	Thr	Leu	Glu	Arg	Thr	Ile
	225				230					235				240	
Lys	Ala	Glu	Gln	Asp	Leu	Glu	Lys	Lys	Val	Glu	Tyr	Ser	Phe	Leu	Leu
				245					250					255	
Gly	Pro	Leu	Leu	Gly	Phe	Val	Val	Tyr	Glu	Ile	Leu	Glu	Asn	Thr	Ala
			260					265				270			
Val	Gln	His	Ile	Lys	Asn	Gln	Ile	Asp	Glu	Ile	Lys	Lys	Gln	Leu	Asp

	275		280		285										
Ser	Ala	Gln	His	Asp	Leu	Asp	Arg	Asp	Val	Lys	Ile	Ile	Gly	Met	Leu
	290					295					300				
Asn	Ser	Ile	Asn	Thr	Asp	Ile	Asp	Asn	Leu	Tyr	Ser	Gln	Gly	Gln	Glu
305					310					315					320
Ala	Ile	Lys	Val	Phe	Gln	Lys	Leu	Gln	Gly	Ile	Trp	Ala	Thr	Ile	Gly
				325					330					335	
Ala	Gln	Ile	Glu	Asn	Leu	Arg	Thr	Thr	Ser	Leu	Gln	Glu	Val	Gln	Asp
			340					345					350		
Ser	Asp	Asp	Ala	Asp	Glu	Ile	Gln	Ile	Glu	Leu	Glu	Asp	Ala	Ser	Asp
	355						360					365			
Ala	Trp	Leu	Val	Val	Ala	Gln	Glu	Ala	Arg	Asp	Phe	Thr	Leu	Asn	Ala
370						375					380				
Tyr	Ser	Thr	Asn	Ser	Arg	Gln	Asn	Leu	Pro	Ile	Asn	Val	Ile	Ser	Asp
385					390					395					400
Ser	Cys	Asn	Cys	Ser	Thr	Thr	Asn	Met	Thr	Ser	Asn	Gln	Tyr	Ser	Asn
				405					410					415	
Pro	Thr	Thr	Asn	Met	Thr	Ser	Asn	Gln	Tyr	Met	Ile	Ser	His	Glu	Tyr
			420					425					430		
Thr	Ser	Leu	Pro	Asn	Asn	Phe	Met	Leu	Ser	Arg	Asn	Ser	Asn	Leu	Glu
		435				440					445				
Tyr	Lys	Cys	Pro	Glu	Asn	Asn	Phe	Met	Ile	Tyr	Trp	Tyr	Asn	Asn	Ser
	450					455					460				
Asp	Trp	Tyr	Asn	Asn	Ser	Asp	Trp	Tyr	Asn	Asn					
465					470					475					

<210> 16

<211> 1138

<212> PRT

<213> *Bacillus thuringiensis*

<400> 16

Met	Asn	Leu	Asn	Asn	Leu	Asp	Gly	Tyr	Glu	Asp	Ser	Asn	Arg	Thr	Leu
1				5					10					15	
Asn	Asn	Ser	Leu	Asn	Tyr	Pro	Thr	Gln	Lys	Ala	Leu	Ser	Pro	Ser	Leu
			20					25					30		
Lys	Asn	Met	Asn	Tyr	Gln	Asp	Phe	Leu	Ser	Ile	Thr	Glu	Arg	Glu	Gln
		35					40				45				
Pro	Glu	Ala	Leu	Ala	Ser	Gly	Asn	Thr	Ala	Ile	Asn	Thr	Val	Val	Ser
	50					55					60				
Val	Thr	Gly	Ala	Thr	Leu	Ser	Ala	Leu	Gly	Val	Pro	Gly	Ala	Ser	Phe
65					70					75					80
Ile	Thr	Asn	Phe	Tyr	Leu	Lys	Ile	Ala	Gly	Leu	Leu	Trp	Pro	Glu	Asn
			85						90					95	
Gly	Lys	Ile	Trp	Asp	Glu	Phe	Met	Thr	Glu	Val	Glu	Ala	Leu	Ile	Asp
			100					105					110		
Gln	Lys	Ile	Glu	Glu	Tyr	Val	Arg	Asn	Lys	Ala	Ile	Ala	Glu	Leu	Asp
		115					120					125			
Gly	Leu	Gly	Ser	Ala	Leu	Asp	Lys	Tyr	Gln	Lys	Ala	Leu	Ala	Asp	Trp
	130					135					140				
Leu	Gly	Lys	Gln	Asp	Asp	Pro	Glu	Ala	Ile	Leu	Ser	Val	Ala	Thr	Glu
145					150					155					160
Phe	Arg	Ile	Ile	Asp	Ser	Leu	Phe	Glu	Phe	Ser	Met	Pro	Ser	Phe	Lys
				165					170					175	
Val	Thr	Gly	Tyr	Glu	Ile	Pro	Leu	Leu	Thr	Val	Tyr	Ala	Gln	Ala	Ala
			180					185					190		

Asn	Leu	His	Leu	Ala	Leu	Leu	Arg	Asp	Ser	Thr	Leu	Tyr	Gly	Asp	Lys
		195					200					205			
Trp	Gly	Phe	Thr	Gln	Asn	Asn	Ile	Glu	Glu	Asn	Tyr	Asn	Arg	Gln	Lys
	210					215					220				
Lys	Arg	Ile	Ser	Glu	Tyr	Ser	Asp	His	Cys	Thr	Lys	Trp	Tyr	Asn	Ser
225					230					235					240
Gly	Leu	Ser	Arg	Leu	Asn	Gly	Ser	Thr	Tyr	Glu	Gln	Trp	Ile	Asn	Tyr
				245					250					255	
Asn	Arg	Phe	Arg	Arg	Glu	Met	Ile	Leu	Met	Ala	Leu	Asp	Leu	Val	Ala
			260					265					270		
Val	Phe	Pro	Phe	His	Asp	Pro	Arg	Arg	Tyr	Ser	Met	Glu	Thr	Ser	Thr
		275					280					285			
Gln	Leu	Thr	Arg	Glu	Val	Tyr	Thr	Asp	Pro	Val	Ser	Leu	Ser	Ile	Ser
	290					295					300				
Asn	Pro	Asp	Ile	Gly	Pro	Ser	Phe	Ser	Gln	Met	Glu	Asn	Thr	Ala	Ile
305					310					315					320
Arg	Thr	Pro	His	Leu	Val	Asp	Tyr	Leu	Asp	Glu	Leu	Tyr	Ile	Tyr	Thr
				325					330					335	
Ser	Lys	Tyr	Lys	Ala	Phe	Ser	His	Glu	Ile	Gln	Pro	Asp	Leu	Phe	Tyr
			340					345					350		
Trp	Ser	Ala	His	Lys	Val	Ser	Phe	Lys	Lys	Ser	Glu	Gln	Ser	Asn	Leu
		355					360					365			
Tyr	Thr	Thr	Gly	Ile	Tyr	Gly	Lys	Thr	Ser	Gly	Tyr	Ile	Ser	Ser	Gly
	370					375					380				
Ala	Tyr	Ser	Phe	His	Gly	Asn	Asp	Ile	Tyr	Arg	Thr	Leu	Ala	Ala	Pro
385					390					395					400
Ser	Val	Val	Val	Tyr	Pro	Tyr	Thr	Gln	Asn	Tyr	Gly	Val	Glu	Gln	Val
				405					410					415	
Glu	Phe	Tyr	Gly	Val	Lys	Gly	His	Val	His	Tyr	Arg	Gly	Asp	Asn	Lys
			420					425					430		
Tyr	Asp	Leu	Thr	Tyr	Asp	Ser	Ile	Asp	Gln	Leu	Pro	Pro	Asp	Gly	Glu
	435						440					445			
Pro	Ile	His	Glu	Lys	Tyr	Thr	His	Arg	Leu	Cys	His	Ala	Thr	Ala	Ile
	450					455					460				
Phe	Lys	Ser	Thr	Pro	Asp	Tyr	Asp	Asn	Ala	Thr	Ile	Pro	Ile	Phe	Ser
465					470					475					480
Trp	Thr	His	Arg	Ser	Ala	Glu	Tyr	Tyr	Asn	Arg	Ile	Tyr	Pro	Asn	Lys
				485					490					495	
Ile	Thr	Lys	Ile	Pro	Ala	Val	Lys	Met	Tyr	Lys	Leu	Asp	Asp	Pro	Ser
			500					505					510		
Thr	Val	Val	Lys	Gly	Pro	Gly	Phe	Thr	Gly	Gly	Asp	Leu	Val	Lys	Arg
		515					520					525			
Gly	Ser	Thr	Gly	Tyr	Ile	Gly	Asp	Ile	Lys	Ala	Thr	Val	Asn	Ser	Pro
	530					535					540				
Leu	Ser	Gln	Lys	Tyr	Arg	Val	Arg	Val	Arg	Tyr	Ala	Thr	Asn	Val	Ser
545					550					555					560
Gly	Gln	Phe	Asn	Val	Tyr	Ile	Asn	Asp	Lys	Ile	Thr	Leu	Gln	Thr	Lys
				565					570					575	
Phe	Gln	Asn	Thr	Val	Glu	Thr	Ile	Gly	Glu	Gly	Lys	Asp	Leu	Thr	Tyr
			580					585					590		
Gly	Ser	Phe	Gly	Tyr	Ile	Glu	Tyr	Ser	Thr	Thr	Ile	Gln	Phe	Pro	Asp
		595					600					605			
Glu	His	Pro	Lys	Ile	Thr	Leu	His	Leu	Ser	Asp	Leu	Ser	Asn	Asn	Ser
	610					615					620				
Ser	Phe	Tyr	Val	Asp	Ser	Ile	Glu	Phe	Ile	Pro	Val	Asp	Val	Asn	Tyr
625					630					635					640
Ala	Glu	Lys	Glu	Lys	Leu	Glu	Lys	Ala	Gln	Lys	Ala	Val	Asn	Thr	Leu

Phe	Thr	Glu	Gly	Arg	Asn	Ala	Leu	Gln	Lys	Asp	Val	Thr	Asp	Tyr	Lys	645	650	655
			660					665					670					
Val	Asp	Gln	Val	Ser	Ile	Leu	Val	Asp	Cys	Ile	Ser	Gly	Asp	Leu	Tyr			
		675					680					685						
Pro	Asn	Glu	Lys	Arg	Glu	Leu	Gln	Asn	Leu	Val	Lys	Tyr	Ala	Lys	Arg			
		690				695					700							
Leu	Ser	Tyr	Ser	Arg	Asn	Leu	Leu	Leu	Asp	Pro	Thr	Phe	Asp	Ser	Ile			
705					710					715					720			
Asn	Ser	Ser	Glu	Glu	Asn	Gly	Trp	Tyr	Gly	Ser	Asn	Gly	Ile	Val	Ile			
			725						730					735				
Gly	Asn	Gly	Asp	Phe	Val	Phe	Lys	Gly	Asn	Tyr	Leu	Ile	Phe	Ser	Gly			
		740						745					750					
Thr	Asn	Asp	Thr	Gln	Tyr	Pro	Thr	Tyr	Leu	Tyr	Gln	Lys	Ile	Asp	Glu			
		755					760					765						
Ser	Lys	Leu	Lys	Glu	Tyr	Thr	Arg	Tyr	Lys	Leu	Lys	Gly	Phe	Ile	Glu			
	770					775					780							
Ser	Ser	Gln	Asp	Leu	Glu	Ala	Tyr	Val	Ile	Arg	Tyr	Asp	Ala	Lys	His			
785					790					795					800			
Arg	Thr	Leu	Asp	Val	Ser	Asp	Asn	Leu	Leu	Pro	Asp	Ile	Leu	Pro	Glu			
			805					810						815				
Asn	Thr	Cys	Gly	Glu	Pro	Asn	Arg	Cys	Ala	Ala	Gln	Gln	Tyr	Leu	Asp			
			820					825					830					
Glu	Asn	Pro	Ser	Pro	Glu	Cys	Ser	Ser	Met	Gln	Asp	Gly	Ile	Leu	Ser			
		835					840					845						
Asp	Ser	His	Ser	Phe	Ser	Leu	Asn	Ile	Asp	Thr	Gly	Ser	Ile	Asn	His			
	850					855					860							
Asn	Glu	Asn	Leu	Gly	Ile	Trp	Val	Leu	Phe	Lys	Ile	Ser	Thr	Leu	Glu			
865					870					875					880			
Gly	Tyr	Ala	Lys	Phe	Gly	Asn	Leu	Glu	Val	Ile	Glu	Asp	Gly	Pro	Val			
			885					890						895				
Ile	Gly	Glu	Ala	Leu	Ala	Arg	Val	Lys	Arg	Gln	Glu	Thr	Lys	Trp	Arg			
		900						905					910					
Asn	Lys	Leu	Ala	Gln	Leu	Thr	Thr	Glu	Thr	Gln	Ala	Ile	Tyr	Thr	Arg			
		915					920					925						
Ala	Lys	Gln	Ala	Leu	Asp	Asn	Leu	Phe	Ala	Asn	Ala	Gln	Asp	Ser	His			
	930					935					940							
Leu	Lys	Arg	Asp	Val	Thr	Phe	Ala	Glu	Ile	Ala	Ala	Ala	Arg	Lys	Ile			
945					950					955					960			
Val	Gln	Ser	Ile	Arg	Glu	Ala	Tyr	Met	Ser	Trp	Leu	Ser	Val	Val	Pro			
			965					970						975				
Gly	Val	Asn	His	Pro	Ile	Phe	Thr	Glu	Leu	Ser	Gly	Arg	Val	Gln	Arg			
		980						985					990					
Ala	Phe	Gln	Leu	Tyr	Asp	Val	Arg	Asn	Val	Val	Arg	Asn	Gly	Arg	Phe			
	995					1000						1005						
Leu	Asn	Gly	Leu	Ser	Asp	Trp	Ile	Val	Thr	Ser	Asp	Val	Lys	Val	Gln			
	1010					1015					1020							
Glu	Glu	Asn	Gly	Asn	Asn	Val	Leu	Val	Leu	Asn	Asn	Trp	Asp	Ala	Gln			
1025					1030					1035					1040			
Val	Leu	Gln	Asn	Val	Lys	Leu	Tyr	Gln	Asp	Arg	Gly	Tyr	Ile	Leu	His			
			1045					1050					1055					
Val	Thr	Ala	Arg	Lys	Ile	Gly	Ile	Gly	Glu	Gly	Tyr	Ile	Thr	Ile	Thr			
		1060						1065					1070					
Asp	Glu	Glu	Gly	His	Thr	Asp	Gln	Leu	Arg	Phe	Thr	Ala	Cys	Glu	Glu			
	1075						1080					1085						
Ile	Asp	Ala	Ser	Asn	Ala	Phe	Ile	Ser	Gly	Tyr	Ile	Thr	Lys	Glu	Leu			
	1090					1095						1100						

Glu Phe Phe Pro Asp Thr Glu Lys Val His Ile Glu Ile Gly Glu Thr
 1105 1110 1115 1120
 Glu Gly Ile Phe Leu Val Glu Ser Ile Glu Leu Phe Leu Met Glu Glu
 1125 1130 1135
 Leu Cys

<210> 17
 <211> 1157
 <212> PRT
 <213> *Bacillus thuringiensis*

<400> 17
 Met Ser Pro Asn Asn Gln Asn Glu Tyr Glu Ile Ile Asp Ala Thr Pro
 1 5 10 15
 Ser Thr Ser Val Ser Ser Asp Ser Asn Arg Tyr Pro Phe Ala Asn Glu
 20 25 30
 Pro Thr Asp Ala Leu Gln Asn Met Asn Tyr Lys Asp Tyr Leu Lys Met
 35 40 45
 Ser Gly Gly Glu Asn Pro Glu Leu Phe Gly Asn Pro Glu Thr Phe Ile
 50 55 60
 Ser Ser Ser Thr Ile Gln Thr Gly Ile Gly Ile Val Gly Arg Ile Leu
 65 70 75 80
 Gly Ala Leu Gly Val Pro Phe Ala Ser Gln Ile Ala Ser Phe Tyr Ser
 85 90 95
 Phe Ile Val Gly Gln Leu Trp Pro Ser Lys Ser Val Asp Ile Trp Gly
 100 105 110
 Glu Ile Met Glu Arg Val Glu Glu Leu Val Asp Gln Lys Ile Glu Lys
 115 120 125
 Tyr Val Lys Asp Lys Ala Leu Ala Glu Leu Lys Gly Leu Gly Asn Ala
 130 135 140
 Leu Asp Val Tyr Gln Gln Ser Leu Glu Asp Trp Leu Glu Asn Arg Asn
 145 150 155 160
 Asp Ala Arg Thr Arg Ser Val Val Ser Asn Gln Phe Ile Ala Leu Asp
 165 170 175
 Leu Asn Phe Val Ser Ser Ile Pro Ser Phe Ala Val Ser Gly His Glu
 180 185 190
 Val Leu Leu Leu Ala Val Tyr Ala Gln Ala Val Asn Leu His Leu Leu
 195 200 205
 Leu Leu Arg Asp Ala Ser Ile Phe Gly Glu Glu Trp Gly Phe Thr Pro
 210 215 220
 Gly Glu Ile Ser Arg Phe Tyr Asn Arg Gln Val Gln Leu Thr Ala Glu
 225 230 235 240
 Tyr Ser Asp Tyr Cys Val Lys Trp Tyr Lys Ile Gly Leu Asp Lys Leu
 245 250 255
 Lys Gly Thr Thr Ser Lys Ser Trp Leu Asn Tyr His Gln Phe Arg Arg
 260 265 270
 Glu Met Thr Leu Leu Val Leu Asp Leu Val Ala Leu Phe Pro Asn Tyr
 275 280 285
 Asp Thr His Met Tyr Pro Ile Glu Thr Thr Ala Gln Leu Thr Arg Asp
 290 295 300
 Val Tyr Thr Asp Pro Ile Ala Phe Asn Ile Val Thr Ser Thr Gly Phe
 305 310 315 320
 Cys Asn Pro Trp Ser Thr His Ser Gly Ile Leu Phe Tyr Glu Val Glu
 325 330 335
 Asn Asn Val Ile Arg Pro Pro His Leu Phe Asp Ile Leu Ser Ser Val

Thr Arg Tyr Arg Leu Arg Gly Phe Val Gly Ser Ser Gln Gly Leu Glu
 805 810 815
 Ile Tyr Thr Ile Arg His Gln Thr Asn Arg Ile Val Lys Asn Val Pro
 820 825 830
 Asp Asp Leu Leu Pro Asp Val Ser Pro Val Asn Ser Asp Gly Ser Ile
 835 840 845
 Asn Arg Cys Ser Glu Gln Lys Tyr Val Asn Ser Arg Leu Glu Gly Glu
 850 855 860
 Asn Arg Ser Gly Asp Ala His Glu Phe Ser Leu Pro Ile Asp Ile Gly
 865 870 875 880
 Glu Leu Asp Tyr Asn Glu Asn Ala Gly Ile Trp Val Gly Phe Lys Ile
 885 890 895
 Thr Asp Pro Glu Gly Tyr Ala Thr Leu Gly Asn Leu Glu Leu Val Glu
 900 905 910
 Glu Gly Pro Leu Ser Gly Asp Ala Leu Glu Arg Leu Gln Arg Glu Glu
 915 920 925
 Gln Gln Trp Lys Ile Gln Met Thr Arg Arg Arg Glu Glu Thr Asp Arg
 930 935 940
 Arg Tyr Met Ala Ser Lys Gln Ala Val Asp Arg Leu Tyr Ala Asp Tyr
 945 950 955 960
 Gln Asp Gln Gln Leu Asn Pro Asp Val Glu Ile Thr Asp Leu Thr Ala
 965 970 975
 Ala Gln Asp Leu Ile Gln Ser Ile Pro Tyr Val Tyr Asn Glu Met Phe
 980 985 990
 Pro Glu Ile Pro Gly Met Asn Tyr Thr Lys Phe Thr Glu Leu Thr Asp
 995 1000 1005
 Arg Leu Gln Gln Ala Trp Asn Leu Tyr Asp Gln Arg Asn Ala Ile Pro
 1010 1015 1020
 Asn Gly Asp Phe Arg Asn Gly Leu Ser Asn Trp Asn Ala Thr Pro Gly
 1025 1030 1035 1040
 Val Glu Val Gln Gln Ile Asn His Thr Ser Val Leu Val Ile Pro Asn
 1045 1050 1055
 Trp Asp Glu Gln Val Ser Gln Gln Phe Thr Val Gln Pro Asn Gln Arg
 1060 1065 1070
 Tyr Val Leu Arg Val Thr Ala Arg Lys Glu Gly Val Gly Asn Gly Tyr
 1075 1080 1085
 Val Ser Ile Arg Asp Gly Gly Asn Gln Ser Glu Thr Leu Thr Phe Ser
 1090 1095 1100
 Ala Ser Asp Tyr Asp Thr Asn Gly Val Tyr Asn Asp Gln Thr Gly Tyr
 1105 1110 1115 1120
 Ile Thr Lys Thr Val Thr Phe Ile Pro Tyr Thr Asp Gln Met Trp Ile
 1125 1130 1135
 Glu Ile Ser Glu Thr Glu Gly Thr Phe Tyr Ile Glu Ser Val Glu Leu
 1140 1145 1150
 Ile Val Asp Val Glu
 1155

<210> 18

<211> 675

<212> PRT

<213> *Bacillus thuringiensis*

<400> 18

Met Asn Pro Tyr Gln Asn Lys Asn Glu Tyr Glu Ile Phe Asn Ala Pro
 1 5 10 15
 Ser Asn Gly Phe Ser Lys Ser Asn Asn Tyr Ser Arg Tyr Pro Leu Ala

			20					25					30				
Asn	Lys	Pro	Asn	Gln	Pro	Leu	Lys	Asn	Thr	Asn	Tyr	Lys	Asp	Trp	Leu		
		35					40					45					
Asn	Val	Cys	Gln	Asp	Asn	Gln	Gln	Tyr	Gly	Asn	Asn	Ala	Gly	Asn	Phe		
		50				55					60						
Ala	Ser	Ser	Glu	Thr	Ile	Val	Gly	Val	Ser	Ala	Gly	Ile	Ile	Val	Val		
65					70					75					80		
Gly	Thr	Met	Leu	Gly	Ala	Phe	Ala	Ala	Pro	Val	Leu	Ala	Ala	Gly	Ile		
				85				90						95			
Ile	Ser	Phe	Gly	Thr	Leu	Leu	Pro	Ile	Phe	Trp	Gln	Gly	Ser	Asp	Pro		
			100					105					110				
Ala	Asn	Val	Trp	Gln	Asp	Leu	Leu	Asn	Ile	Gly	Gly	Arg	Pro	Ile	Gln		
		115					120					125					
Glu	Ile	Asp	Lys	Asn	Ile	Ile	Asn	Val	Leu	Thr	Ser	Ile	Val	Thr	Pro		
		130				135					140						
Ile	Lys	Asn	Gln	Leu	Asp	Lys	Tyr	Gln	Glu	Phe	Phe	Asp	Lys	Trp	Glu		
145					150					155					160		
Pro	Ala	Arg	Thr	His	Ala	Asn	Ala	Lys	Ala	Val	His	Asp	Leu	Phe	Thr		
				165					170						175		
Thr	Leu	Glu	Pro	Ile	Ile	Asp	Lys	Asp	Leu	Asp	Met	Leu	Lys	Asn	Asn		
			180					185					190				
Ala	Ser	Tyr	Arg	Ile	Pro	Thr	Leu	Pro	Ala	Tyr	Ala	Gln	Ile	Ala	Thr		
		195					200					205					
Trp	His	Leu	Asn	Leu	Leu	Lys	His	Ala	Ala	Thr	Tyr	Tyr	Asn	Ile	Trp		
		210				215						220					
Leu	Gln	Asn	Gln	Gly	Ile	Asn	Pro	Ser	Thr	Phe	Asn	Ser	Ser	Asn	Tyr		
225					230					235					240		
Tyr	Gln	Gly	Tyr	Leu	Lys	Arg	Lys	Ile	Gln	Glu	Tyr	Thr	Asp	Tyr	Cys		
				245					250					255			
Ile	Gln	Thr	Tyr	Asn	Ala	Gly	Leu	Thr	Met	Ile	Arg	Thr	Asn	Thr	Asn		
		260						265					270				
Ala	Thr	Trp	Asn	Met	Tyr	Asn	Thr	Tyr	Arg	Leu	Glu	Met	Thr	Leu	Thr		
		275					280					285					
Val	Leu	Asp	Leu	Ile	Ala	Ile	Phe	Pro	Asn	Tyr	Asp	Pro	Glu	Lys	Tyr		
		290				295					300						
Pro	Ile	Gly	Val	Lys	Ser	Glu	Leu	Ile	Arg	Glu	Val	Tyr	Thr	Asn	Val		
305					310					315					320		
Asn	Ser	Asp	Thr	Phe	Arg	Thr	Ile	Thr	Glu	Leu	Glu	Asn	Gly	Leu	Thr		
				325					330					335			
Arg	Asn	Pro	Thr	Leu	Phe	Thr	Trp	Ile	Asn	Gln	Gly	Arg	Phe	Tyr	Thr		
			340					345					350				
Arg	Asn	Ser	Arg	Asp	Ile	Leu	Asp	Pro	Tyr	Asp	Ile	Phe	Ser	Phe	Thr		
		355				360						365					
Gly	Asn	Gln	Met	Ala	Phe	Thr	His	Thr	Asn	Asp	Asp	Arg	Asn	Ile	Ile		
		370				375					380						
Trp	Gly	Ala	Val	His	Gly	Asn	Ile	Ile	Ser	Gln	Asp	Thr	Ser	Lys	Val		
385					390					395					400		
Phe	Pro	Phe	Tyr	Arg	Asn	Lys	Pro	Ile	Asp	Lys	Val	Glu	Ile	Val	Arg		
				405					410					415			
His	Arg	Glu	Tyr	Ser	Asp	Ile	Ile	Tyr	Glu	Met	Ile	Phe	Phe	Ser	Asn		
			420					425					430				
Ser	Ser	Glu	Val	Phe	Arg	Tyr	Ser	Ser	Asn	Ser	Thr	Ile	Glu	Asn	Asn		
		435					440					445					
Tyr	Lys	Arg	Thr	Asp	Ser	Tyr	Met	Ile	Pro	Lys	Gln	Thr	Trp	Lys	Asn		
		450				455					460						
Glu	Glu	Tyr	Gly	His	Thr	Leu	Ser	Tyr	Ile	Lys	Thr	Asp	Asn	Tyr	Ile		
465					470					475					480		

Phe	Ser	Val	Val	Arg	Glu	Arg	Arg	Arg	Val	Ala	Phe	Ser	Trp	Thr	His	
				485					490					495		
Thr	Ser	Val	Asp	Phe	Gln	Asn	Thr	Ile	Asp	Leu	Asp	Asn	Ile	Thr	Gln	
			500					505					510			
Ile	His	Ala	Leu	Lys	Ala	Leu	Lys	Val	Ser	Ser	Asp	Ser	Lys	Ile	Val	
		515					520					525				
Lys	Gly	Pro	Gly	His	Thr	Gly	Gly	Asp	Leu	Val	Ile	Leu	Lys	Asp	Ser	
	530					535					540					
Met	Asp	Phe	Arg	Val	Arg	Phe	Leu	Lys	Asn	Val	Ser	Arg	Gln	Tyr	Gln	
545					550					555					560	
Val	Arg	Ile	Arg	Tyr	Ala	Thr	Asn	Ala	Pro	Lys	Thr	Thr	Val	Phe	Leu	
			565						570					575		
Thr	Gly	Ile	Asp	Thr	Ile	Ser	Val	Glu	Leu	Pro	Ser	Thr	Thr	Ser	Arg	
		580						585						590		
Gln	Asn	Pro	Asn	Ala	Thr	Asp	Leu	Thr	Tyr	Ala	Asp	Phe	Gly	Tyr	Val	
		595					600					605				
Thr	Phe	Pro	Arg	Thr	Val	Pro	Asn	Lys	Thr	Phe	Glu	Gly	Glu	Asp	Thr	
	610					615					620					
Leu	Leu	Met	Thr	Leu	Tyr	Gly	Thr	Pro	Asn	His	Ser	Tyr	Asn	Ile	Tyr	
625					630					635				640		
Ile	Asp	Lys	Ile	Glu	Phe	Ile	Pro	Ile	Thr	Gln	Ser	Val	Leu	Asp	Tyr	
			645					650						655		
Thr	Glu	Lys	Gln	Asn	Ile	Glu	Lys	Thr	Gln	Lys	Ile	Val	Asn	Asp	Leu	
			660					665					670			
Phe	Val	Asn														
		675														

<210> 19
 <211> 648
 <212> PRT
 <213> Bacillus thuringiensis

<400> 19																
Met	His	Tyr	Tyr	Gly	Asn	Arg	Asn	Glu	Tyr	Asp	Ile	Leu	Asn	Ala	Ser	
1				5				10					15			
Ser	Asn	Asp	Ser	Asn	Met	Ser	Asn	Thr	Tyr	Pro	Arg	Tyr	Pro	Leu	Ala	
			20					25					30			
Asn	Pro	Gln	Gln	Asp	Leu	Met	Gln	Asn	Thr	Asn	Tyr	Lys	Asp	Trp	Leu	
		35					40					45				
Asn	Val	Cys	Glu	Gly	Tyr	His	Ile	Glu	Asn	Pro	Arg	Glu	Ala	Ser	Val	
	50					55				60						
Arg	Ala	Gly	Leu	Gly	Lys	Gly	Leu	Gly	Ile	Val	Ser	Thr	Ile	Val	Gly	
65					70					75				80		
Phe	Phe	Gly	Gly	Ser	Ile	Ile	Leu	Asp	Thr	Ile	Gly	Leu	Phe	Tyr	Gln	
			85					90					95			
Ile	Ser	Glu	Leu	Leu	Trp	Pro	Glu	Asp	Asp	Thr	Gln	Gln	Tyr	Thr	Trp	
		100						105					110			
Gln	Asp	Ile	Met	Asn	His	Val	Glu	Asp	Leu	Ile	Asp	Lys	Arg	Ile	Thr	
	115						120					125				
Glu	Val	Ile	Arg	Gly	Asn	Ala	Ile	Arg	Thr	Leu	Ala	Asp	Leu	Gln	Gly	
	130					135					140					
Lys	Val	Asp	Asp	Tyr	Asn	Asn	Trp	Leu	Lys	Lys	Trp	Lys	Asp	Asp	Pro	
145					150					155					160	
Lys	Ser	Thr	Gly	Asn	Leu	Ser	Thr	Leu	Val	Thr	Lys	Phe	Thr	Ala	Leu	
			165					170						175		
Asp	Ser	Asp	Phe	Asn	Gly	Ala	Ile	Arg	Thr	Val	Asn	Asn	Gln	Gly	Ser	

42

Lys Ile Glu Phe Leu Pro Thr Asn
645

<210> 20
<211> 682
<212> PRT
<213> *Bacillus thuringiensis*

<400> 20
Met Asn Ser Tyr Gln Asn Lys Asn Glu Tyr Glu Ile Leu Asp Ala Lys
1 5 10 15
Arg Asn Thr Cys His Met Ser Asn Cys Tyr Pro Lys Tyr Pro Leu Ala
20 25 30
Asn Asp Pro Gln Met Tyr Leu Arg Asn Thr His Tyr Lys Asp Trp Ile
35 40 45
Asn Met Cys Glu Glu Ala Ser Tyr Ala Ser Ser Gly Pro Ser Gln Leu
50 55 60
Phe Lys Val Gly Gly Ser Ile Val Ala Lys Ile Leu Gly Met Ile Pro
65 70 75 80
Glu Val Gly Pro Leu Leu Ser Trp Met Val Ser Leu Phe Trp Pro Thr
85 90 95
Ile Glu Glu Lys Asn Thr Val Trp Glu Asp Met Ile Lys Tyr Val Ala
100 105 110
Asn Leu Leu Lys Gln Glu Leu Thr Asn Asp Thr Leu Asn Arg Ala Thr
115 120 125
Ser Asn Leu Ser Gly Leu Asn Glu Ser Leu Asn Ile Tyr Asn Arg Ala
130 135 140
Leu Ala Ala Trp Lys Gln Asn Lys Asn Asn Phe Ala Ser Gly Glu Leu
145 150 155 160
Ile Arg Ser Tyr Ile Asn Asp Leu His Ile Leu Phe Thr Arg Asp Ile
165 170 175
Gln Ser Asp Phe Ser Leu Gly Gly Tyr Glu Thr Val Leu Leu Pro Ser
180 185 190
Tyr Ala Ser Ala Ala Asn Leu His Leu Leu Leu Leu Arg Asp Val Ala
195 200 205
Ile Tyr Gly Lys Glu Leu Gly Tyr Pro Ser Thr Asp Val Glu Phe Tyr
210 215 220
Tyr Asn Glu Gln Lys Tyr Tyr Thr Glu Lys Tyr Ser Asn Tyr Cys Val
225 230 235 240
Asn Thr Tyr Lys Ser Gly Leu Glu Ser Lys Lys Gln Ile Gly Trp Ser
245 250 255
Asp Phe Asn Arg Tyr Arg Arg Glu Met Thr Leu Ser Val Leu Asp Ile
260 265 270
Val Ala Leu Phe Pro Leu Tyr Asp Thr Gly Leu Tyr Pro Ser Lys Asp
275 280 285
Gly Lys Ile His Val Lys Ala Glu Leu Thr Arg Glu Ile Tyr Ser Asp
290 295 300
Val Ile Asn Asp His Val Tyr Gly Leu Met Val Pro Tyr Ile Ser Phe
305 310 315 320
Glu His Ala Glu Ser Leu Tyr Thr Arg Arg Pro His Ala Phe Thr Trp
325 330 335
Leu Lys Gly Phe Arg Phe Val Thr Asn Ser Ile Asn Ser Trp Thr Phe
340 345 350
Leu Ser Gly Gly Glu Asn Arg Tyr Phe Leu Thr His Gly Glu Gly Thr
355 360 365
Ile Tyr Asn Gly Pro Phe Leu Gly Gln Asp Thr Glu Tyr Gly Gly Thr

370		375		380
Ser Ser Tyr Ile Asp	Ile Ser Asn Asn Ser Ser Ile Tyr Asn Leu Trp			
385		390		395
Thr Lys Asn Tyr Glu Trp	Ile Tyr Pro Trp Thr Asp Pro Val Asn Ile			400
	405		410	415
Thr Lys Ile Asn Phe Ser	Ile Thr Asp Asn Ser Asn Ser Ser Glu Ser			
	420		425	430
Ile Tyr Gly Ala Glu Arg Met	Asn Lys Pro Thr Val Arg Thr Asp Phe			
	435		440	445
Asn Phe Leu Leu Asn Arg Ala	Gly Asn Gly Pro Thr Thr Tyr Asn Asp			
	450		455	460
Tyr Asn His Ile Leu Ser Tyr	Met Leu Ile Asn Gly Glu Thr Phe Gly			
465		470		475
Gln Lys Arg His Gly Tyr Ser	Phe Ala Phe Thr His Ser Ser Val Asp			480
	485		490	495
Arg Tyr Asn Thr Ile Val Pro	Asp Lys Ile Val Gln Ile Pro Ala Val			
	500		505	510
Lys Thr Asn Leu Val Gly Ala	Asn Ile Ile Lys Gly Pro Gly His Thr			
	515		520	525
Gly Gly Asp Leu Leu Lys Leu	Glu Tyr Glu Arg Phe Leu Ser Leu Arg			
	530		535	540
Ile Lys Leu Ile Ala Ser Met	Thr Phe Arg Ile Arg Ile Arg Tyr Ala			
545		550		555
Ser Asn Ile Ser Gly Gln Met	Met Ile Asn Ile Gly Tyr Gln Asn Pro			
	565		570	575
Thr Tyr Phe Asn Ile Ile Pro	Thr Thr Ser Arg Asp Tyr Thr Glu Leu			
	580		585	590
Lys Phe Glu Asp Phe Gln Leu	Val Asp Thr Ser Tyr Ile Tyr Ser Gly			
	595		600	605
Gly Pro Ser Ile Ser Ser Asn	Thr Leu Trp Leu Asp Asn Phe Ser Asn			
	610		615	620
Gly Pro Val Ile Ile Asp Lys	Ile Glu Phe Ile Pro Leu Gly Ile Thr			
625		630		635
Leu Asn Gln Ala Gln Gly Tyr	Asp Thr Tyr Asp Gln Asn Ala Asn Gly			
	645		650	655
Met Tyr His Gln Asn Tyr Ser	Asn Ser Gly Tyr Asn Tyr Asn Gln Glu			
	660		665	670
Tyr Asn Thr Tyr Tyr Gln Ser	Tyr Asn Asn			
	675		680	

<210> 21
 <211> 674
 <212> PRT
 <213> Bacillus thuringiensis

<400> 21
 Met Asn Gln Tyr Gln Asn Lys Asn Glu Tyr Glu Ile Leu Glu Ser Ser
 1 5 10 15
 Gln Asn Asn Met Asn Met Pro Asn Arg Tyr Pro Phe Ala Asp Asp Pro
 20 25 30
 Asn Ala Val Met Lys Asn Gly Asn Tyr Lys Asp Trp Val Asn Glu Cys
 35 40 45
 Glu Gly Ser Asn Ile Ser Pro Ser Pro Ala Ala Ala Ile Thr Ser Lys
 50 55 60
 Ile Val Ser Ile Val Leu Lys Thr Leu Ala Lys Ala Val Ala Ser Ser
 65 70 75 80

Leu	Ala	Asp	Ser	Ile	Lys	Ser	Ser	Leu	Gly	Ile	Ser	Lys	Thr	Ile	Thr
				85					90					95	
Glu	Asn	Asn	Val	Ser	Gln	Val	Ser	Met	Val	Gln	Val	His	Gln	Ile	Ile
			100					105					110		
Asn	Arg	Arg	Ile	Gln	Glu	Thr	Ile	Leu	Asp	Leu	Gly	Glu	Ser	Ser	Leu
			115				120					125			
Asn	Gly	Leu	Val	Ala	Ile	Tyr	Asn	Arg	Asp	Tyr	Leu	Gly	Ala	Leu	Glu
			130			135					140				
Ala	Trp	Asn	Asn	Asn	Lys	Ser	Asn	Ile	Asn	Tyr	Gln	Thr	Asn	Val	Ala
145					150					155					160
Glu	Ala	Phe	Lys	Thr	Val	Glu	Arg	Glu	Phe	Phe	Thr	Lys	Leu	Lys	Gly
				165					170					175	
Ile	Tyr	Arg	Thr	Ser	Ser	Ser	Gln	Ile	Thr	Leu	Leu	Pro	Thr	Phe	Thr
			180				185						190		
Gln	Ala	Ala	Asn	Leu	His	Leu	Ser	Met	Leu	Arg	Asp	Ala	Val	Met	Tyr
			195				200					205			
Gln	Glu	Gly	Trp	Asn	Leu	Gln	Ser	His	Ile	Asn	Tyr	Ser	Lys	Glu	Leu
			210			215					220				
Asp	Asp	Ala	Leu	Glu	Asp	Tyr	Thr	Asn	Tyr	Cys	Val	Glu	Val	Tyr	Thr
225					230				235						240
Lys	Gly	Leu	Asn	Ala	Leu	Arg	Gly	Ser	Thr	Ala	Ile	Asp	Trp	Leu	Glu
				245					250					255	
Phe	Asn	Ser	Phe	Arg	Arg	Asp	Met	Thr	Leu	Met	Val	Leu	Asp	Leu	Val
			260				265						270		
Ala	Ile	Phe	Pro	Asn	Tyr	Asn	Pro	Val	Arg	Tyr	Pro	Leu	Ser	Thr	Lys
			275				280					285			
Ile	Ser	Leu	Ser	Arg	Lys	Ile	Tyr	Thr	Asp	Pro	Val	Gly	Arg	Thr	Asp
			290			295				300					
Ser	Pro	Ser	Phe	Gly	Asp	Trp	Thr	Asn	Thr	Gly	Arg	Thr	Leu	Ala	Asn
305					310					315					320
Phe	Asn	Asp	Leu	Glu	Arg	Glu	Val	Thr	Asp	Ser	Pro	Ser	Leu	Val	Lys
				325					330					335	
Trp	Leu	Gly	Asp	Met	Thr	Ile	Tyr	Thr	Gly	Ala	Ile	Asp	Ser	Tyr	Arg
			340					345					350		
Pro	Thr	Ser	Pro	Gly	Asp	Arg	Ile	Gly	Val	Trp	Tyr	Gly	Asn	Ile	Asn
			355				360					365			
Ala	Phe	Tyr	His	Thr	Gly	Arg	Thr	Asp	Val	Val	Met	Phe	Arg	Gln	Thr
					375					380					
Gly	Asp	Thr	Ala	Tyr	Glu	Asp	Pro	Ser	Thr	Phe	Ile	Ser	Asn	Ile	Leu
385					390					395					400
Tyr	Asp	Asp	Ile	Tyr	Lys	Leu	Asp	Leu	Arg	Ala	Ala	Ala	Val	Ser	Thr
				405					410					415	
Ile	Gln	Gly	Ala	Met	Asp	Thr	Thr	Phe	Gly	Val	Ser	Ser	Ser	Arg	Phe
			420					425					430		
Phe	Asp														

530		535		540
Lys Met Ser Tyr His Ser Val Trp Ser Phe Lys Val Tyr Cys Ser Glu				
545		550		555
Leu Lys Asn Tyr Arg Val Arg Ile Arg Tyr Ala Ser His Gly Asn Cys				
	565		570	
Gln Phe Leu Met Lys Arg Trp Pro Ser Thr Gly Val Ala Pro Arg Gln				
	580		585	
Trp Ala Arg His Asn Val Gln Gly Thr Phe Ser Asn Ser Met Arg Tyr				
	595		600	
Glu Ala Phe Lys Tyr Leu Asp Ile Phe Thr Ile Thr Pro Glu Glu Asn				
	610		615	
Asn Phe Ala Phe Thr Ile Asp Leu Glu Ser Gly Gly Asp Leu Phe Ile				
625		630		635
Asp Lys Ile Glu Phe Ile Pro Val Ser Gly Ser Ala Phe Glu Tyr Glu				
	645		650	
Gly Lys Gln Asn Ile Glu Lys Thr Gln Lys Ala Val Asn Asp Leu Phe				
	660		665	
Ile Asn				

<210> 22
 <211> 675
 <212> PRT
 <213> *Bacillus thuringiensis*

<400> 22
Met Asn Pro Tyr Gln Asn Lys Ser Glu Cys Glu Ile Leu Asn Ala Pro
1 5 10 15
Leu Asn Asn Ile Asn Met Pro Asn Arg Tyr Pro Phe Ala Asn Asp Pro
20 25 30
Asn Ala Val Met Lys Asn Gly Asn Tyr Lys Asp Trp Leu Asn Glu Cys
35 40 45
Asp Gly Ile Thr Pro Ser Ile Phe Gly Thr Leu Gly Val Leu Ala Ser
50 55 60
Ile Val Ile Ser Thr Ile Asn Leu Ala Thr Ser Pro Ser Ile Gly Asp
65 70 75 80
Ala Phe Ala Leu Val Ser Ser Ile Gly Glu Tyr Trp Pro Glu Thr Lys
85 90 95
Thr Ser Phe Pro Leu Ser Val Ala Asp Val Asn Arg Leu Ile Arg Glu
100 105 110
Ala Leu Asp Gln Asn Ala Ile Asn Arg Ala Thr Gly Lys Phe Asn Gly
115 120 125
Leu Met Asp Thr Tyr Asn Thr Val Tyr Leu Lys Asn Leu Gln Asp Trp
130 135 140
Tyr Asp Thr Arg Ile Pro Ala Asn Pro Gln Gly Asp Ser Gln Leu Arg
145 150 155 160
Glu Ala Ala Arg Arg Ser Leu Glu Glu Ile Glu Arg Asp Phe Arg Lys
165 170 175
Ala Leu Ala Gly Glu Phe Ala Glu Ala Gly Ser Gln Ile Val Leu Leu
180 185 190
Pro Ile Tyr Ala Gln Ala Ala Asn Ile His Leu Leu Ile Leu Lys Asp
195 200 205
Ala Met Gln Phe Arg Thr Asp Leu Gly Leu Ile Arg Pro Val Gly Val
210 215 220
Pro Ile Thr Thr Ser Ala Glu Asp Pro Phe Glu Ser Glu Phe Leu Leu
225 230 235 240

Arg	Ile	Lys	Lys	Tyr	Thr	Asp	His	Cys	Ile	Ser	Tyr	Tyr	Asp	Asp	Gly			
				245					250					255				
Leu	Ala	Lys	Ile	Arg	Ser	Arg	Gly	Ser	Asp	Gly	Glu	Thr	Trp	Trp	Glu			
			260					265					270					
Phe	Asn	Lys	Phe	Arg	Arg	Glu	Met	Thr	Leu	Thr	Val	Leu	Asp	Leu	Val			
		275					280						285					
Ala	Leu	Tyr	Pro	Thr	His	Asn	Ile	Lys	Leu	Tyr	Pro	Ile	Pro	Thr	Gln			
	290					295					300							
Thr	Glu	Leu	Ser	Arg	Val	Val	Tyr	Thr	Asp	Pro	Val	Gly	Cys	Phe	Gly			
305					310					315					320			
Asn	Arg	Lys	Ser	Asp	Ile	Phe	Ser	Arg	Leu	Asn	Phe	Asp	Tyr	Leu	Glu			
			325						330					335				
Asn	Arg	Leu	Thr	Arg	Pro	Arg	Glu	Pro	Phe	Asn	Tyr	Leu	Asn	Ser	Val			
		340						345					350					
Gln	Leu	Phe	Ala	Ser	Thr	Val	Ser	Asn	Ser	Asn	Asn	Gly	Glu	Val	Leu			
	355						360					365						
Arg	Gly	Asn	Leu	Asn	Lys	Ile	Met	Phe	Glu	Gly	Gly	Trp	Thr	Ala	Ser			
	370					375					380							
Arg	Ser	Gly	Asp	Gly	Val	Thr	Thr	Gly	Thr	Pro	Phe	Ser	Thr	Met	Asp			
385					390					395					400			
Trp	Ser	Tyr	Gly	Trp	Gly	Tyr	Pro	Arg	Lys	His	Tyr	Ala	Glu	Ile	Thr			
			405						410					415				
Ser	Arg	Ser	Gln	Ala	Leu	Pro	Gly	Leu	Asn	Asn	Ser	Ile	His	Val	Ile			
			420					425					430					
Val	Gly	Ile	Asp	Ser	Phe	Arg	Ala	Ile	Gly	Pro	Gly	Gly	Gln	Gly	Asp			
	435						440					445						
His	Thr	Phe	Ser	Leu	Pro	Gly	Gly	Asp	Met	Tyr	Asp	Cys	Gly	Lys	Val			
	450					455					460							
Gln	Ile	Asn	Pro	Leu	Glu	Asp	Tyr	Arg	Asn	Ser	Asp	His	Trp	Ile	Ser			
465					470					475					480			
Asp	Met	Met	Thr	Ile	Asn	Gln	Ser	Val	Gln	Leu	Ala	Ser	Asn	Pro	Thr			
			485						490					495				
Gln	Thr	Phe	Ala	Phe	Ser	Ala	Leu	Ser	Leu	Gly	Trp	His	His	Ser	Ser			
		500						505					510					
Ala	Gly	Asn	Arg	Asn	Val	Tyr	Val	Tyr	Asp	Lys	Ile	Thr	Gln	Ile	Pro			
	515						520						525					
Ala	Thr	Lys	Thr	Val	Arg	Glu	His	Pro	Met	Ile	Lys	Gly	Pro	Gly	Phe			
	530					535					540							
Thr	Gly	Gly	Asp	Leu	Ala	Asp	Leu	Ser	Ser	Asn	Ser	Asp	Ile	Leu	Gln			
545					550					555					560			
Tyr	Asp	Leu	Arg	Ser	Asp	Tyr	Asp	Asp	Arg	Leu	Thr	Glu	Asp	Val	Pro			
			565						570					575				
Phe	Arg	Ile	Arg	Ile	Arg	Cys	Ala	Ser	Ile	Gly	Val	Ser	Thr	Ile	Ser			
		580						585					590					
Val	Asp	Asn	Trp	Gly	Ser	Ser	Ser	Pro	Gln	Val	Thr	Val	Ala	Ser	Thr			
	595						600					605						
Ala	Ala	Ser	Leu	Asp	Thr	Leu	Lys	Tyr	Glu	Ser	Phe	Gln	Tyr	Val	Ser			
	610					615					620							
Ile	Pro	Gly	Asn	Tyr	Tyr	Phe	Asp	Ser	Ala	Pro	Arg	Ile	Arg	Leu	Leu			
625					630					635					640			
Arg	Gln	Pro	Gly	Arg	Leu	Leu	Val	Asp	Arg	Ile	Glu	Ile	Ile	Pro	Val			
			645						650					655				
Asn	Phe	Phe	Pro	Leu	Ser	Glu	Gln	Glu	Asn	Lys	Ser	Val	Asp	Ser	Leu			
			660					665					670					
Phe	Ile	Asn																
		675																

<210> 23
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<400> 23

Asn	Ser	Tyr	Glu	Asn	Lys	Asn	Glu	Tyr	Glu	Ile	Leu	Glu	Ser	Ser	Ser
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Asn	Asn	Thr	Asn	Met	Pro	Asn	Arg	Tyr	Pro	Phe	Ala	Asn	Asp	Arg	Asp
			20					25					30		
Met	Ser	Thr	Met	Ser	Phe	Asn	Asp	Cys	Gln	Gly	Ile	Ser	Trp	Asp	Glu
		35					40					45			
Ile	Trp	Glu	Ser	Ala	Glu	Thr	Ile	Thr	Ser	Ile	Gly	Ile	Asp	Leu	Ile
	50					55					60				
Glu	Phe	Leu	Met	Glu	Pro	Ser	Leu	Gly	Gly	Ile	Asn	Thr	Leu	Phe	Ser
65					70					75					80
Ile	Ile	Gly	Lys	Leu	Ile	Pro	Thr	Asn	His	Gln	Ser	Val	Ser	Ala	Leu
			85						90					95	
Ser	Ile	Cys	Asp	Leu	Leu	Ser	Ile	Ile	Arg	Lys	Glu	Val	Ala	Asp	Ser
			100					105					110		
Val	Leu	Ser	Asp	Ala	Ile	Cys	Arg	Phe	Leu	Asp	Gly	Lys	Leu	Lys	Asn
		115					120					125			
Tyr	Arg	Glu	Tyr	Tyr	Leu	Pro	Tyr	Leu	Glu	Ala	Trp	Leu	Lys	Asp	Gly
	130					135						140			
Lys	Pro	Leu	Gln	Lys	Thr	Asn	Asn	Ser	Asp	Ile	Gly	Gln	Leu	Val	Lys
145					150					155					160
Tyr	Phe	Glu	Leu	Ser	Glu	Arg	Asp	Phe	Asn	Glu	Ile	Leu	Gly	Gly	Ser
			165					170						175	
Leu	Ala	Arg	Asn	Asn	Ala	Gln	Ile	Leu	Leu	Leu	Pro	Tyr	Phe	Cys	Ala
			180					185					190		
Ser	Cys	Lys	Cys	Gln	Leu	Leu	Leu	Arg	Asp	Ala	Val	Gln	Tyr	Glu	
		195					200				205				
Glu	Gln	Trp	Phe	Pro	Phe	Leu	Ser	Ala	Glu	Asn	Val	Arg	Ser	Glu	Leu
	210					215					220				
Ile	Ser	Pro	Asn	Ser	Gly	Cys	Asp	Phe	Thr	Gly	Asp	Tyr	Tyr	Glu	Arg
225					230					235					240
Leu	Lys	Cys	Lys	Ile	Ala	Glu	Tyr	Thr	Asp	Tyr	Cys	Glu	Tyr	Trp	Tyr
			245						250					255	
Gln	Ala	Gly	Leu	Asn	Gln	Ile	Lys	Gln	Ala	Gly	Thr	Gly	Ala	Asp	Thr
		260						265					270		
Trp	Ala	Lys	Phe	Asn	Lys	Phe	Arg	Arg	Glu	Met	Thr	Leu	Thr	Val	Leu
		275				280						285			
Asp	Ile	Ile	Ala	Ile	Phe	Gln	Thr	Tyr	Asp	Phe	Lys	Lys	Tyr	Pro	Leu
	290					295					300				
Pro	Thr	His	Val	Glu	Leu	Thr	Arg	Glu	Ile	Tyr	Thr	Asp	Pro	Val	Gly
305					310					315					320
Tyr	Ser	Ser	Gly	Thr	Tyr	Ser	Trp	Leu	Lys	Tyr	Trp	Thr	Gly	Ala	Phe
			325						330					335	
Asn	Thr	Leu	Glu	Ala	Asn	Gly	Thr	Arg	Gly	Pro	Gly	Leu	Val	Thr	Trp
		340						345					350		
Leu	Arg	Ser	Ile	Gly	Ile	Tyr	Asn	Glu	Tyr	Val	Ser	Arg	Tyr	Phe	Ser
		355					360					365			
Gly	Trp	Val	Gly	Thr	Arg	His	Tyr	Glu	Asp	Tyr	Thr	Thr	Gly	Asn	Gly
	370					375					380				
Asn	Phe	Gln	Arg	Met	Ser	Gly	Thr	Thr	Ser	Asn	Asp	Leu	Arg	Asp	Ile
385					390					395					400

Ser	Phe	Pro	Asn	Ser	Asp	Ile	Phe	Lys	Ile	Glu	Ser	Lys	Ala	Ile	Met
				405					410					415	
Asn	Leu	Val	Gly	Glu	Ile	Asn	Ala	Arg	Pro	Glu	Tyr	Arg	Val	Ser	Arg
			420					425					430		
Ala	Glu	Phe	Ser	Glu	Ser	Thr	Ala	Phe	Ile	Tyr	Leu	Tyr	Asp	Ala	Gly
		435					440					445			
Asn	Ser	Gly	Leu	Ser	Ser	Met	Thr	Ile	Thr	Ser	Lys	Leu	Pro	Gly	Ile
	450					455					460				
Lys	Asn	Pro	Glu	Pro	Ser	Tyr	Arg	Asp	Tyr	Ser	His	Arg	Leu	Ser	Asn
465					470					475					480
Ala	Ala	Cys	Val	Gly	Ala	Gly	Asn	Ser	Arg	Ile	Asn	Val	Tyr	Gly	Trp
			485						490					495	
Thr	His	Thr	Ser	Met	Ser	Lys	Tyr	Asn	Leu	Ile	Tyr	Pro	Asp	Lys	Ile
			500					505					510		
Thr	Gln	Ile	Pro	Ala	Val	Lys	Ala	Phe	Asp	Ile	Ser	Asp	Thr	Gly	Pro
	515						520					525			
Gly	Gln	Val	Ile	Ala	Gly	Pro	Gly	His	Thr	Gly	Gly	Asn	Val	Val	Ser
	530					535					540				
Leu	Pro	Tyr	Tyr	Ser	Arg	Leu	Lys	Ile	Arg	Leu	Ile	Pro	Ala	Ser	Thr
545					550					555					560
Asn	Lys	Asn	Tyr	Leu	Val	Arg	Val	Arg	Tyr	Thr	Ser	Thr	Ser	Asn	Gly
			565						570					575	
Arg	Leu	Leu	Val	Glu	Arg	Trp	Ser	Pro	Ser	Ser	Ile	Ile	Asn	Ser	Tyr
			580					585					590		
Phe	Phe	Leu	Pro	Ser	Thr	Gly	Pro	Gly	Asp	Ser	Phe	Gly	Tyr	Val	Asp
		595					600					605			
Thr	Leu	Val	Thr	Thr	Phe	Asn	Gln	Pro	Gly	Val	Glu	Ile	Ile	Ile	Gln
	610					615					620				
Asn	Leu	Asp	Thr	Pro	Ile	Asn	Val	Asp	Lys	Val	Glu	Phe	Ile	Pro	Val
625					630					635					640
Asn	Ser	Thr	Ala	Leu	Glu	Tyr	Glu	Gly	Lys	Gln	Ser	Leu	Glu	Lys	Ala
			645						650					655	
Gln	Asp	Val	Val	Asn	Asp	Leu	Phe	Val	Lys						
		660						665							